Vol. 998 Number 3

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UNITED STATES PATENT AND TRADEMARK OFFICE

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September 16, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 16, 1980 Volume 998 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

June 17, 1980.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,107,949, Re. S.N. 162,040, Filed Jun. 20, 1980, Cl. 64/9 A, TOOL SHANK AND CHUCK COMBINATION FOR HAMMER DRILL, Karl Wanner, et al., Owner of Record: *Robert Bosch, G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 345

PATENT NOTICES

Certificates of Correction for the Week of Sept. 16, 1980

Plt. 4,347	4,166,844	4,190,470	4,205,233
4,007,535	4,167,102	4,190,820	4,205,735
4,063,265	4,167,530	4,192,889	4,207,492
4,068,365	4,167,626	4,192,901	4,207,707
4,077,322	4,168,184	4,193,840	4,207,760
4,093,756	4,168,285	4,198,243	4,207,829
4,097,093	4,169,702	4,198,432	4,207,870
4,125,399	4,170,096	4,198,685	4,208,130
4,125,510	4,178,278	4,200,487	4,208,506
4,125,515	4,181,132	4,201,105	4,209,255
4,125,541	4,181,508	4,201,575	4,209,419
4,128,560	4,182,210	4,201,952	4,209,826
4,132,745	4,185,073	4,202,044	4,209,873
4,150,026	4,185,622	4,202,842	4,210,235
4,151,843	4,186,748	4,203,337	4,210,366
4,154,618	4,188,325	4,203,464	4,210,507
4,161,173	4,188,968	4,205,086	4,210,631
4,166,068	4,189,137	4,205,184	4,211,046
			4,211,554

Disclaimers

3,885,977.—*Irwin M. Lachman* and *Ronald M. Lewis*, Corning, N.Y. ANISOTROPIC CORDIERITE MONOLITH. Patent dated May 27, 1975. Disclaimer filed July 23, 1980, by the assignee, *Corning Glass Works*.

Hereby enters this disclaimer to claims 11 through 20 and claim 27 of said patent.

3,972,367.—*Michael F. X. Gigliotti, Jr.*, Scotia and *Charles D. Greskovich*, Schenectady, N.Y. PROCESS FOR FORMING A BARRIER LAYER ON CERAMIC MOLDS SUITABLE FOR USE FOR HIGH TEMPERATURE EUTECTIC SUPERALLOY CASTING. Patent dated Aug. 3, 1976. Disclaimer filed July 28, 1980, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 5, 6, 20–24, 26–30, 32–36, 41, 46–50 and 54 of said patent.

4,031,945.—*Michael F. X. Gigliotti, Jr.*, Scotia and *Charles D. Greskovich*, Schenectady, N.Y. PROCESS FOR MAKING CERAMIC MOLDS HAVING A METAL OXIDE BARRIER FOR CASTING AND DIRECTIONAL SOLIDIFICATION OF SUPERALLOYS. Patent dated June 28, 1977. Disclaimer filed July 28, 1980, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 19, 20, 21 and 22 of said patent.

4,196,822.—*Walter C. Avrea*, Tempe, Ariz. MONOLITHIC RADIATOR CAP FOR SEALED PRESSURIZED COOLING SYSTEM. Patent dated Apr. 8, 1980. Disclaimer filed July 21, 1980, by the inventor.

The term subsequent to Mar. 21, 1995 has been disclaimed.

Disclaimer and Dedication

3,989,453.—*Dara Ardeshir Jilla*, Collinsville, Va. MULTICOLORING POLYESTER TEXTILE MATERIALS WITH ACID DYES. Patent dated Nov. 2, 1976. Disclaimer and dedication filed June 24, 1980, by the assignee, *Martin Processing Company, Incorporated*.

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 960,410. Beam Heated Linear Theta-Pinch Device for Producing Hot Plasma. Filed Nov. 13, 1978.

Patent application 942,229. Method of Removing Actinide Elements From Mammalian Tissue. Filed Sept. 14, 1978.

Patent application 949,163. Radiation Detection System. Filed Oct. 6, 1978.

Patent application 956,317. Method for Fabricating Boron Carbide Articles. Filed Oct. 31, 1978.

Patent application 956,709. Cross-Flow Electrofilter and Method. Filed Nov. 1, 1978.

Patent application 957,619. Treatment of Electrochemical Cell Components With Lithium Tetrachloraluminate ($LiAlCl_4$) to Promote Electrolyte Wetting. Filed Nov. 3, 1978.

Patent application 960,982. Method for Inhibiting Corrosion in Aqueous Systems. Filed Nov. 15, 1978.

Patent application 961,152. Ceramic Component for Electrodes. Filed Nov. 16, 1978.

Patent application 967,178. Method of Making V_3Ga Superconductors. Filed Dec. 6, 1978.

Patent 4,148,405. Solid Feeder and Method. Filed Dec. 1, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,150,759. Solids Feeder Apparatus. Filed Dec. 1, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,152,248. Hydrogenation of Coal Liquid Utilizing a Metal Carbonyl Catalyst. Filed May 2, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,153,427. Apparatus and Method for Feeding Coal Into a Coal Gasifier. Filed Feb. 23, 1978. Patented May 8, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,178,722. Grinding and Polishing Tool. Filed Jan. 18, 1978. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,194. Electrically Controllable Wide Angle of View Optical Notch Filter. Filed Feb. 2, 1976. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,782. Cable Terminal-Ferrule Attaching Apparatus. Filed May 1, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,181,904. Acoustic-Wave Convolvers Utilizing Diffused Waveguides and Beam Compression Techniques. Filed Aug. 9, 1978. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,183,088. Random Number Generator. Filed Jan. 31, 1962. Patented Jan. 8, 1980. Not available NTIS.

Patent 4,185,161. Modular Guyline Insulator. Filed Aug. 22, 1977. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,274. High-Speed Electrooptical A/D Converter. Filed July 12, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,188,710. Ohmic Contacts for Group III–V N-Type Semiconductors Using Epitaxial Germanium Films. Filed Aug. 11, 1978. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,194,142. Mode Control Apparatus for a Separable-Insert Coaxial Magnetron. Filed July 10, 1978. Patented Mar. 18, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 9, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-17-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordinance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-27-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-9-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-2-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-18-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	1-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-5-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-4-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	4-2-79

Expiration of patents: The patents within the range of numbers indicated below expire during August 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,099,837 to 3,102,260, inclusive
Plant Patents..... Numbers 2,271 to 2,276, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,403

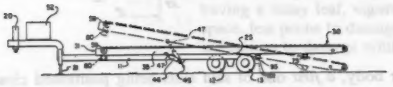
SAFETY VALVE FOR FLUID SYSTEMS

Paul A. Bitonti, Canonsburg, Pa., assignor to Ross Operating Valve Company, Detroit, Mich.

Original No. 4,759,284, dated Feb. 28, 1978, Ser. No. 474,901, May 31, 1974. Application for reissue Aug. 14, 1978, Ser. No. 933,720

Int. Cl.[2] F15B *13/04*

U.S. Cl. 91—29 5 Claims



1. In combination with a reciprocable motor, a compressed air supply line for said reciprocable motor, said line having a supply valve for selectively pressurizing and exhausting said line and a control valve for said motor fed by said line through said supply valve, a safety valve interposed between said supply and control valves, said safety valve having a housing, supply and outlet ports in said housing, a radial valve seat in said housing, a valve stem carrying a poppet valve member engageable with said seat, said supply port being connected to said seat so as to urge said poppet valve member against the seat, a spring urging said member against the seat, a piston carried by said stem and movable in a piston chamber in said housing leading to one face of said housing, a portion of said piston chamber being formed by a cover mounted on said housing face, means separating the other side of said piston from said supply and outlet ports, a first passage in said housing leading from said supply port to the portion of said piston chamber formed by said cover, *means comprising* an unrestricted second passage [in said housing] leading from said portion of the piston chamber to said outlet port, and means for adjustably restricting said first passage, said means comprising a member manually movable with respect to said passage and accessible by an operator from the outside of said housing in the vicinity of said housing face and cover, said adjustable restriction member further comprising a needle valve rotatably mounted in said cover passing through said piston chambers portion and disposed within a portion of said first passage, whereby rotation of said needle valve will adjust restriction, the relative dimensions of said piston and spring being such that said piston will shift said valve member against the urging of said spring to its open position when a predetermined proportion of said full line pressure has been reached.

Re. 30,404

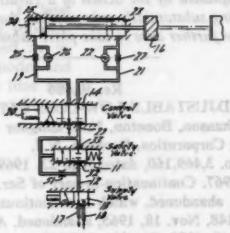
CONVEYOR-TRAILER FOR TRANSPORTING AN AGRICULTURAL COMMODITY

Ernest G. Pereira, San Jose, Calif., and Guy W. Fitch, deceased, late of Cupertino, Calif. (by Lisa A. Fitch, administrator), assignors to Cotton Machinery Company, Inc., Livermore, Calif.

Original No. 4,081,094, dated Mar. 28, 1978, Ser. No. 778,702, Mar. 17, 1977. Application for reissue Aug. 7, 1978, Ser. No. 931,504

Int. Cl.[2] B60P *1/38*

U.S. Cl. 414—439 19 Claims



8. Means for transporting agricultural commodities comprising:

(a) a first frame;

(b) means for supporting said frame for movement along a surface;

(c) a conveyor frame supported by said first frame for pivotal movement;

(d) means interconnecting said first frame and said conveyor frame for moving said conveyor frame between a horizontal position and an inclined position;

(e) conveyor means carried by said conveyor frame for movement therewith and journalled by said conveyor frame for advancement relative to said conveyor frame;

(f) independent power drive means for said conveyor means supported by said conveyor frame for movement therewith and connected to said conveyor means for advancing said conveyor means relative to said conveyor frame;

(g) a servo mechanism mounted on said conveyor frame for movement therewith and coupled to said independent power drive means for controlling the speed at which said independent power drive means operates said conveyor means, said servo mechanism including means having a rotatable member idled when said conveyor frame is in the horizontal position and rotated when said conveyor frame is in the inclined position at a speed commensurate with the speed of movement of said first frame along the surface, said servo mechanism being responsive to the rotation of said rotatable member for controlling the operation of said independent power drive means to idle said conveyor means when said rotatable member is idle and to advance said conveyor means at a rate related to the rotation of said rotatable member, when said rotatable member is rotated; and

(h) means for rotating said rotatable member at a speed commensurate with the speed of movement of said first frame along the surface when said conveyor frame is in the inclined position.

Re. 30,405

THERMOPLASTIC BLEND OF PARTIALLY CURED MONOOLEFIN COPOLYMER RUBBER AND POLYOLEFIN PLASTIC

William K. Fischer, Meaford, Canada, assignor to Uniroyal, Inc., New York, N.Y.

Original No. 3,758,643, dated Sep. 11, 1973, Ser. No. 108,225, Jan. 20, 1971. Application for reissue Sep. 11, 1978, Ser. No. 941,601

Int. Cl.[2] C08L *23/16*

U.S. Cl. 525—240 44 Claims

1. A thermoplastic reprocessable blend of (A) a rubbery copolymer of ethylene and at least one other copolymerizable monoolefin of the formula CH_2=CHR where R is an alkyl radical having from one to 12 carbon atoms, with or without at least one copolymerizable polyene, said copolymer being partially cross-linked, prior to blending to a gel content of at least 30 percent but less than 90 percent by weight measured by immersion in cyclohexane for 48 hours at 73° F., and (B) an uncross-linked resinous polyolefin, the weight ratio of (A) to (B) being from 10:90 to 90:10, *said partial cross-linking having been accomplished by the action of a curative, the action of the curative being substantially exhausted so that there is little or no tendency for further cure to take place subsequently.*

Re. 30,406

ADJUSTABLE LOW-LOSS CAPACITOR

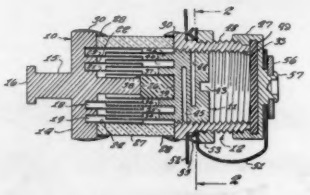
John E. Johanson, Boonton, N.J., assignor to Johanson Manufacturing Corporation, Boonton, N.J.

Original No. 3,469,160, dated Sep. 23, 1969, Ser. No. 665,527, Sep. 5, 1967. Continuation-in-part of Ser. No. 558,150, Jun. 16, 1966, abandoned, which is a continuation-in-part of Ser. No. 510,148, Nov. 18, 1965, abandoned. Application for reissue Aug. 18, 1978, Ser. No. 935,085

Int. Cl.[2] H01G *5/14*

U.S. Cl. 361—296 1 Claim

1. In an adjustable air dielectric capacitor having a hollow cylindrical stator electrode and a coaxially positioned cylindrical rotor electrode and including threaded tuning means operatively coupled to the rotor for making precision capacity adjustments by moving the rotor axially of the stator the improvement which comprises an electrically conductive body portion mounting said stator, a cylindrical electrically insulating housing surrounding said electrodes and attached at one end to said body, a hollow cylindrical electrically conducting bushing having an outer diameter about equal to that of said housing and having one circular end coupled to said housing, the hollow center of said bushing being threaded and having a diameter about equal to that of inner walls of said housing, a generally cylindrical rotor body having a threaded outer surface *with threads initially aligned and capable of* engaging the threads of said bushing, said rotor electrode being coupled at one circular end to one end of said rotor body for movement therewith, a pair of parallel flat bottomed slots of equal depth formed in the threaded portion of said rotor body extending radially inwardly from diametrically opposed threaded rotor surfaces a distance substantially greater than the radius of said



rotor body, *a first* one of said slots being positioned closely adjacent to the other end of said body thereby defining a relatively resilient threaded end portion on said rotor body, the second slot being formed closely adjacent to said [one] *first* slot for forming a resilient connecting portion between the said [one end of said rotor body and said rotor body threaded end portion], *slats* and [portions of the rotor body] *said resilient portion being axially compressed to resiliently misalign said threads and impart a permanent deformation to said rotor body whereby said misaligned portion of the rotor body* threads on opposite sides of said slots [exerting] *exert* an axially directed gripping force on the threads of said bushing thereby resisting unintentional turning and eliminating relative lateral movement of said electrodes.

PLANT PATENTS

GRANTED SEPTEMBER 16, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,592

VITACEAE; *CISSUS RHOMBIFOLIA* NAMED MANDA'S COMPACTA

Albert W. Manda, Short Hills, N.J., assignor to W. A. Manda Inc., Livingston, N.J.

Filed Nov. 29, 1978, Ser. No. 964,659

Int. Cl.[2] A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Cissus rhombifolia,* substantially as herein shown and described, characterized by its self-branching and compactness, closer spacing of nodes and having a shiny leaf, vigorous growing habit in less time and space, less prone to damage, and easier propagation and lesser inclination to damage while in retail outlets.

PATENTS

GRANTED SEP. 16, 1980

ERRATA

For CLASS	See PATENT NO.
368–113	4,222,226
368–027	4,222,227
368–291	4,222,228
474–112	4,222,280
371–027	4,222,514
371–068	4,222,515
177–132	4,222,551
085–041	4,222,689
430–055	4,222,776
430–363	4,222,777
423–057	4,222,872
455–617	4,222,880
556–478	4,222,951
556–462	4,222,952
556–466	4,222,953
568–384	4,222,963
568–420	4,222,964
568–461	4,222,965
568–451	4,222,966
156–272	4,222,974
521–116	4,223,098
528–076	4,223,101
528–168	4,223,102
528–168	4,223,103
528–169	4,223,104
528–179	4,223,105
526–208	4,223,120
368–118	4,223,267
371–049	4,223,326
362–210	4,223,394

PATENTS

GRANTED SEP. 16, 1980

ERRATA

Re CLASS	Re PATENT NO
268-113	4,222,710
268-027	4,222,707
268-291	4,222,272
414-112	4,222,290
371-027	4,222,514
371-068	4,222,515
177-122	4,222,597
083-041	4,222,689
430-035	4,222,774
430-303	4,222,777
423-021	4,222,173
455-017	4,222,860
250-478	4,222,947
250-402	4,222,802
250-466	4,222,923
208-334	4,222,943
208-420	4,222,944
208-461	4,222,945
208-451	4,222,946
156-272	4,222,974
427-170	4,222,109
218-070	4,222,104
208-168	4,222,103
208-169	4,222,103
208-170	4,222,104
208-179	4,222,105
208-208	4,222,120
208-118	4,222,207
371-069	4,222,124
208-210	4,222,204

PATENTS

GRANTED SEPTEMBER 16, 1980

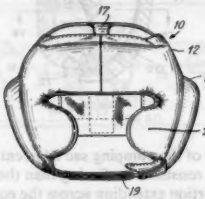
GENERAL AND MECHANICAL

4,222,122

BOXING HEADGUARD

John L. Toms, Bellport, N.Y., assignor to Everlast World's Boxing Headquarters Corp., Bronx, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,925
Int. Cl.[3] A42B *1/08*; A63B *71/10*
U.S. Cl. 2—9 **7 Claims**



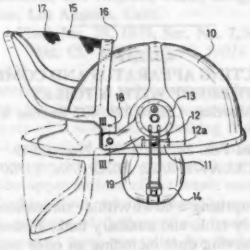
1. In a headguard including a padded front panel having upper and lower parts, side panels extending rearward from the front panel, each side panel having upper, rear, and lower parts and an ear protector intermediate these parts, and an adjustable chin strap for interconnecting and varying the distance between the lower parts of the side panels, the improvement in combination therewith comprising; (a) a laceless rear band extending between and secured to said rear parts of said panels, said rear band being resiliently elastic in the transverse direction between said side panels, (b) at least one essentially inelastic belt means having one end secured to a first of said side panels and a remote end extendable to the second of said side panels, (c) first fastener means for releasably coupling said remote end of said belt means to said second side panel, said belt means adapted to overlie said rear band for varying and releasably fixing the distance between said side panels, (d) second belt means comprising a generally inelastic top belt having one end secured to said front panel and a remote end extendable rearward to engage said rear band, and (e) second fastener means for releasably coupling said remote end of the second belt means to said rear band for varying and releasably fixing the distance beween said front panel and said rear band.

4,222,123

MOUNTING A FACE SHIELD AT A PROTECTIVE HELMET

Arne Hellberg, Gråbo, Sweden, assignor to Hellberg Protection AB, Sweden

Filed Feb. 28, 1979, Ser. No. 16,177
Claims priority, application Sweden, Mar. 7, 1978, 7802554
Int. Cl.[2] A42B *1/06, 3/00*
U.S. Cl. 2—10 **5 Claims**



1. Means for releasably mounting a swingable face shield on a protective helmet having a hard shell being defined by a lower rim including a front portion, comprising two external, upwardly open pockets at juxtaposed portions of the lower rim of the helmet,

two fittings, each having a first arm adapted to be inserted in one of said pockets, as well as a second, elongate and resilient arm adapted, in mounted position, to extend towards the front of said rim,

a face shield having two mounting tabs,

a stud-in-bore joint to releasably mount each of said mounting tabs inside of an associated second arm, and

a distance member acting between the inward face of each mounting tab and a juxtaposed portion of the helmet shell to force each mounting tab against its associated resilient second arm.

4,222,124

QUILTED CLOTHING WITH REINFORCED SEAM

Michiko Hiranishi, 7-4-3, Akasaka, Minato-ku, Tokyo, Japan

Filed Aug. 3, 1978, Ser. No. 930,522
Claims priority, application Japan, Sep. 9, 1977, 52-120592[U]
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—93 **4 Claims**

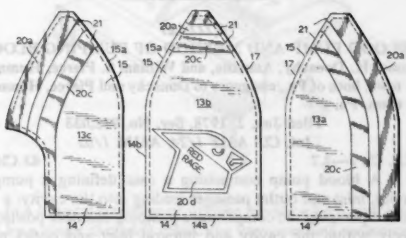
1. Clothing having a collar characterized in that quilted cloth "Sashiko" is utilized as the main material without backing and the free cut marginal edges are doubly folded and hemmed with a flat seam with a reinforcing tape being interposed between the double folded hem so as to be machine-sewn with stitches in plural rows together with said cloth lying above and below said tape, whereby collar portions are formed solely of onehold "Betazashi" cloth except for the marginal portions which are folded and hemmed with tape.

4,222,125

SURFACE ORNAMENTED CAP

Tom Sewell-Wood, Louisville, Ky., assignor to Louisville Manufacturing Co., Inc., Louisville, Ky.

Filed Apr. 27, 1979, Ser. No. 34,010
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—195 **6 Claims**



5. A surface ornamented cap comprising a plurality of panels each having a base portion and an upwardly extending tapered

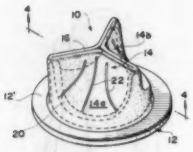
portion defined by opposite upper inwardly curved edges, the upwardly tapered edges of each panel being turned inwardly of the cap in a hem and sewn to the hems of adjacent panels along the junction of the panels and the hems in seams to form the crown of the cap, surface ornamentation on the tapered portions of at least some of the panels, said surface ornamentation having been provided prior to assembly and having directionally oriented portions which cross the seams of the cap at a crossing angle other than perpendicular to the seams, said directionally oriented portions on each ornamented panel extending up to the junctions of the hems and the remainder of said panel at the crossing angle of said directionally oriented portions and further extending across said hems from said junction to the tapered edges of said panel at an angle perpendicular to said tapered edges.

4,222,126

UNITIZED THREE LEAFLET HEART VALVE

John W. Boretos, Rockville, Md., and Norio Iriguchi, Shizuoka, Japan, assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Dec. 14, 1978, Ser. No. 969,571
Int. Cl.³ A61F *1/22*
U.S. Cl. 3—1.5 **5 Claims**



1. An artificial heart valve comprising a semirigid polyurethane framework having three projecting symmetrical struts and being open axially therethrough;

a polyurethane elastomeric membrane integral with said framework, attached to one end thereof to said struts and the contours of which comprise three leaflets, the leading edges of said three leaflets being reinforced with a narrow band of the same polyurethane elastomeric material which is integral therewith, the leading edges of said three leaflets also being capable of coming together to form a commissure line, said elastomeric membrane being joined to said framework along a tapered transition area of said framework, said elastomeric membrane also having reinforcing lines of greater thickness then said elastomeric membrane and projecting from the boundary of said framework/elastomeric material transition boundary; and

a polyurethane suture base, integral with said framework at the end of said framework opposite from said elastomeric membrane, for attaching the valve to the tissues of the heart.

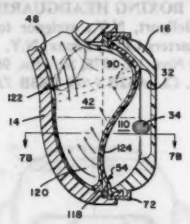
4,222,127

BLOOD PUMP AND METHOD OF PUMPING BLOOD

James H. Donachy, Annville, and William S. Pierce, Hummelstown, both of Pa., assignors to Donachy and Pierce, Hummelstown, Pa.

Filed Jun. 2, 1978, Ser. No. 912,033
Int. Cl.³ A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **43 Claims**

1. A blood pump comprising a case defining a pumping cavity, inlet and outlet passages leading into the cavity; a thin walled pumping sac comprising a pumping chamber positioned freely within the cavity and integral inlet and outlet ports positioned within the inlet and outlet passages, the chamber including first and second parts and an equator joining the parts with the outlet port formed in the first part adjacent the equator; inlet and outlet valves on the case at the ends of the inlet and outlet passages connected in a fluid flow relation to said inlet and outlet ports for controlling the flow of blood through the pump; means for alternately expanding and collapsing the second part of the chamber to pump blood past the



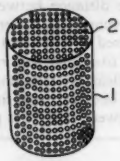
valves, a portion of the pumping sac adjacent to the outlet port having a greater resistance to flexing than the remainder of the chamber, said portion extending across the equator and overlying the outlet port, whereby during pumping of blood from the chamber the portion collapses subsequent to collapse of the remainder of the chamber.

4,222,128

COMPOSITE IMPLANT MATERIALS AND PROCESS FOR PREPARING SAME

Atsushi Tomonaga, Tachikawa, and Hideki Aoki, Funabashi, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1978, Ser. No. 903,579
Claims priority, application Japan, May 20, 1977, 52-57553
Int. Cl.³ A61C *8/00*; A61F *1/00*
U.S. Cl. 3—1.9 **8 Claims**



1. A composite implant material usable as a prosthesis for a bone or tooth, comprising a perforated sintered apatite material having perforation holes formed therein in a desired configuration and a thermoplastic or thermosetting resin, at least said perforated sintered apatite material existing in a continuous phase, said resin being filled or impregnated into said holes, and the respective phases of said sintered apatite material and said resin being exposed, in part, to the surface of said implant material.

4,222,129

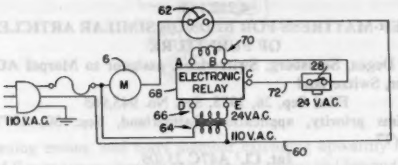
ODOR EXTRACTING APPARATUS AND COMBINATION THEREOF WITH A TOILET

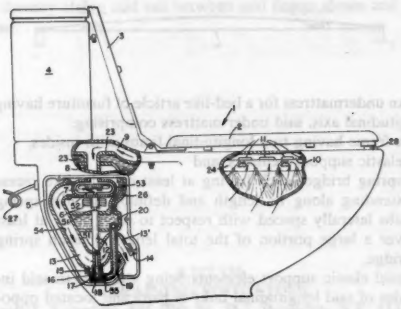
Ivan M. Baker, Martinez Castro 271, 407 Buenos Aires, Argentina

Filed Feb. 26, 1979, Ser. No. 15,549
Int. Cl.³ A47K *3/22*; E03D *9/04, 13/00*
U.S. Cl. 4—213 **7 Claims**

1. A toilet comprising a bowl with a conventional cavity; a flush water supply tank; and auxiliary tank; a pumping chamber; an odor removing duct including an odor receiving portion extending around the inner periphery of the bowl adjacent its upper edge and a rearward portion leading from said odor receiving portion to an upwardly extending section, and a downwardly extending section with a suction chamber, and

trap portion at the lower level of said duct in combination with an odor extracting apparatus including an extractor element located in said suction chamber, an hydraulic pump located in said pumping chamber, and a drive motor having a shaft with one end drivingly connected to said extractor element and its other end drivingly connected to said hydraulic pump for simultaneously driving said extractor element and said hydraulic pump; said auxiliary tank being situated at a level below said flush water supply tank and at a level above said pumping chamber and including a first passage connecting said supply





tank to said auxiliary tank and a second passage connecting said pumping chamber to said auxiliary tank; said pumping chamber having an opening communicating with said trap portion through a perforation in the bottom of said trap portion adjacent the upstream end thereof whereby water from said auxiliary tank will provide a water trap in said trap portion to prevent sewer gas from backing in said toilet during idle condition thereof; said pump operating to evacuate water forming a trap in said siphon portion to said auxiliary tank simultaneous with operation of said extractor element to remove odor from said toilet.

4,222,130

WATERLESS FLUSH TOILET SYSTEM

George C. Roberts, Los Angeles, Calif., assignor to Inca-One Corporation, Los Angeles, Calif.

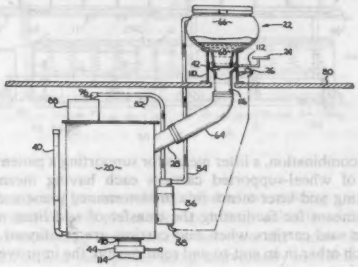
Filed Jan. 29, 1979, Ser. No. 7,146
Int. Cl.[3] E03D *5/0016, 5/014*
U.S. Cl. 4—321 **21 Claims**

1. In a waterless flushing toilet system including at least one toilet, a waste holding tank having a waste inlet and a waste outlet, a supply of a nonaqueous flushing fluid stored in said holding tank, said fluid being lighter than and substantially insoluble in water, so that a stratified layer of said fluid is formed on the upper surface of the waste material held in the tank and a flushing fluid pickup device disposed in said tank for removing a quantity of flushing fluid from said tank to be delivered to said at least one toilet for flushing purposes, an improvement comprising:

a perforated position disposed in said tank which divides said tank into a solid waste and a liquid waste compartment with said waste inlet and outlet being disposed in said solid waste compartment and said fluid pickup device being disposed in said liquid waste compartment;

wherein said flushing fluid pickup device is a pickup float which floats within said liquid waste compartment, said float comprising an upper pickup float member and a lower pickup float member coupled to and spaced apart from said upper member, said upper and lower members defining a plenum containing flushing fluid with at least one flushing fluid inlet being disposed in said plenum; and

a hose having a first end coupled to said pickup float and in communication with said at least one flushing fluid inlet



and a second end coupled to a means for supplying said flushing fluid to said at least one toilet, said hose being substantially in the form of a coil with said pickup float being suspended by said hose;

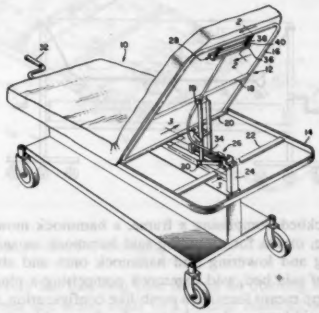
whereby solid and liquid phase waste arriving from said at least one toilet through said waste inlet is deposited in said solid waste compartment with said partition impeding the transfer of the solid phase waste from said solid waste compartment to said liquid waste compartment where said flushing fluid is picked up by said float member and delivered to said at least one toilet through said hose.

4,222,131

HOOK TYPE FOWLER FOR HOSPITAL STRETCHERS

Donald H. Holdt, and James S. Sims, Jr., both of Cambridge, Md., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Sep. 15, 1978, Ser. No. 942,528
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—79 **17 Claims**

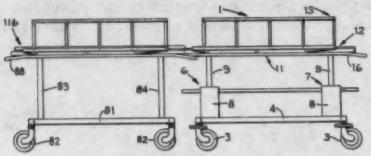


1. In a hospital stretcher of the like having a back rest actuated by a single threaded crank, the improvement comprising quick release means to permit said back rest to be disengaged from the single threaded crank to be moved rapidly to the fully reclined position.

4,222,132
PATIENT TRANSPORT APPARATUS

Paul E. Crim, Portage; James W. Richmond, Comstock Township, Kalamazoo County, and Thomas E. Yeomans, Portage, all of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Jan. 22, 1979, Ser. No. 5,000
Int. Cl.[2] A47B *83/04*; A61G *1/02*
U.S. Cl. 5—81 R **16 Claims**



1. In combination, a litter means for supporting a patient, and a pair of wheel-supported carriers each having means for supporting said litter means in a predetermined plane and also having means for facilitating the transfer of said litter means between said carriers when said carriers are positioned adjacent each other in an end-to-end relationship, the improvement comprising:

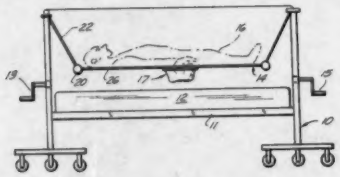
cooperating means provided on said carriers (1) for automatically guiding said carriers into longitudinal alignment with respect to each other as said carriers are relatively moved toward one another into said adjacent end-to-end relationship and (2) for holding said carriers rigidly against movement with respect to each other in a transverse direction when said carriers are in said adjacent end-to-end relationship, whereby transfer of said litter means between said carriers may be effected efficiently and safely;

said cooperating means including guide means rigidly provided on at least one of said carriers, and receiving means rigidly provided on the other of said carriers and snugly slidably engageable with said guide means as said carriers are relatively moved toward one another into said adjacent end-to-end relationship.

4,222,133
SICKBED WITH HAMMOCK

Laszlo K. Csatary, 1913 Windsor Rd., Alexandria, Va. 22307

Filed Oct. 2, 1978, Ser. No. 947,588
Int. Cl.[2] A61G *7/02*
U.S. Cl. 5—90 **2 Claims**



1. A sickbed comprising a frame, a hammock mounted on said frame, means for mounting said hammock on said frame for raising and lowering said hammock onto and above the mattress of said bed, said hammock comprising a plurality of flexible strip means forming a mesh-like configuration, a cutout means in said hammock, and means for removably attaching a sanitary bowl to said cutout from underside of said hammock, wherein said hammock at each end thereof comprises a stiffening rod means, means for flexibly connecting said stiffening rod means to a suspension point on each side of said hammock for joining said hammock to said frame, wherein said sanitary cutout in said hammock comprises a Velcro-strip means circumferentially and a sanitary bowl of the disposable type is removably attached to said Velcro-strip means, and swiveling means comprised in said frame for causing when actuated a timed slow swiveling of said hammock in a predetermined direction, wherein said sanitary cutout in said hammock comprises fastening means and said sanitary bowl of the disposble type and made from a soft plastic material including mating fastening means is removably attached to said fastening means on said cutout.

4,222,134
UNDER-MATTRESS FOR BEDS OR SIMILAR ARTICLES OF FURNITURE

Hugo Degen, Seltisberg, Switzerland, assignor to Marpal AG, Chur, Switzerland

Filed Sep. 26, 1978, Ser. No. 945,965
Claims priority, application Switzerland, Sep. 30, 1977, 12002/77
Int. Cl.[2] A47C *23/06*
U.S. Cl. 5—191 **18 Claims**

1. An undermattress for a bed-like article of furniture having a longitudinal axis, said under-mattress comprising:

(a) a frame having two longitudinal limbs with insides,

(b) elastic support elements, and

(c) spring bridges each having at least one slot-like recess extending along its length and defining parallel spring laths laterally spaced with respect to each other at least over a large portion of the total length of each spring bridge,

(d) said elastic support elements being attached to said insides of said longitudinal links in pairs and located opposite each other for supporting said spring bridges which are arranged transversely to said longitudinal axis of said under-mattress,

(e) each support element possesses a lower portion which is mounted on two pins projecting laterally at the longitudinal limb of the bed-like article of furniture,

(f) the upwardly facing outer surface of said lower portion being curved convexly upwardly and having a middle region supporting a downwardly convexly curved spring lath support which is constructed in the manner of a rocker,

(g) said spring lath support comprises at least two holder elements serving for anchoring the ends of said spring laths.

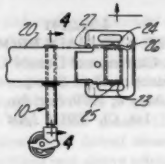
4,222,135
BED FRAME WITH IMPROVED LEG SUPPORTS

Ned W. Mizelle, Lexington, Ky., assignor to Hoover Universal, Inc., Saline, Mich.

Filed Jan. 19, 1979, Ser. No. 4,679
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—310 **7 Claims**

1. In combination with a bed-carrying frame having side and end rails each having top and bottom surfaces, a supporting leg comprising an elongated body member having a hollow top end and a bottom end, a portion of said body member intermediate the ends thereof having integral flange means extending transversely outwardly from said body member, said flange means having a collar portion extending upwardly toward said top end of said body member, means providing upright opening means in one of said rails of a size larger than the cross sectional size of the portion of said body member between said flange means and said top end thereof to enable said body member to be extended upwardly therethrough, said body

member being disposed in said opening means at a position in which said collar portion extends into and fills said opening means adjacent the bottom surface of said one rail, said collar portion being operable to transfer downwardly directed loads on said frame to said body member at said flange means and to constrain transverse movement of said body member in said



opening means, said body member extending upwardly from said flange means through said opening means and beyond said rail top surface, the top end of said body member being deformed so as to form a head engaged with said rail top surface to thereby clamp said rail between said flange means and said head.

4,222,136

TRAINING FOOT STOOL

Pearl T. Valentino, 846 50th St., D-2, Brooklyn, N.Y. 11220

Filed May 25, 1979, Ser. No. 42,986

Int. Cl.³ A47C *19/22*

U.S. Cl. 5—443 **1 Claim**

1. A training foot stool, comprising in combination, a horizontal plate rigidly affixed to a pair of upward legs, and a pair of tubular hooks in which upper ends of said legs are slidably adjustable; said plate being rectangular, said legs being affixed to one side edge wall of said plate, and said legs beings spaced apart from each other; said hook being shaped by having a mouth that is correspondingly a same as a cross-section of a bed rail; each said leg having a row of notches, and each said hook having a spring-loaded detent pin for selectively engaging said notches; and said pins and said notches being additionally thread-engaged only at their fully engaged position, by a screw thread at an end of said pin and a screw thread at a bottom of said notches.

4,222,137

INTERNAL PRESSURE ADJUSTABLE BED

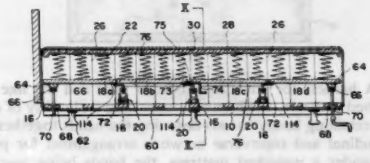
Nobuo Usami, Tokyo, Japan, assignor to Nihon Bed Manufacturing Company, Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,348

Claims priority, application Japan, Mar. 20, 1978, 53-30954; Mar. 20, 1978, 53-34566[U]; Jun. 6, 1978, 53-67237; Aug. 4, 1978, 53-94544

Int. Cl.² A47C *23/04*

U.S. Cl. 5—446 **10 Claims**



1. An internal pressure-adjustable bed comprising:

a plurality of base plates arranged longitudinally of the bed and extending transversely between the sides thereof, each of said base plates being individually movable vertically;

a resilient mattress carried on said base plates;

means for constraining the upper surface of said mattress to maintan same in a substantially horizontal disposition;

and means for effecting selective vertical movement of said base plates to thereby enable selective longitudinal regulation of the internal pressure of said resilient mattress.

4,222,138

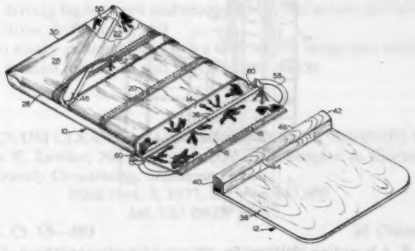
POSTURE CASE

Richard L. Rowley, 141 Maple Ave., Altamont, N.Y. 12009

Filed Aug. 14, 1978, Ser. No. 933,522

Int. Cl.² A47C *7/62*

U.S. Cl. 5—448 **10 Claims**



1. A posture case for changing the pitch of a chair composed of:

a relatively flat carrying case having an opening at at least one end and being made of a flexible material; and

an inclined plane member fit within the carrying case, said inclined plane member being comprised of a springy plate and a shim firmly fastened along an end thereof, said plate and shim defining a storage space within the carying case;

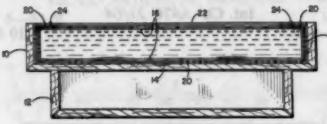
whereby the pitch of a chair may be effectively changed upon placement of the posture case thereon.

4,222,139

FASTENING OF MATTRESS PADS AND THE LIKE

Laura J. Svedberg-Reker, and Jay J. Reker, both of 7545 Pleasantview Dr., Moundsview, Minn. 55432

Filed Apr. 30, 1979, Ser. No. 34,631
Int. Cl.[3] A47C 27/08
U.S. Cl. 5—498 18 Claims



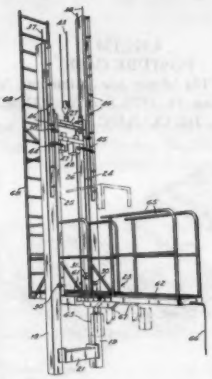
1. A harness for attaching mattress pads and the like to a waterbed mattress, the harness comprising a plurality of elongated retaining bands; means fastening the bands together in a longitudinal and transverse network arrangement for placement under a waterbed mattress, the bands being spacedly arranged relative to each other and of such a length as to extend from underneath the mattress to the upper surface thereof at spaced locations along all four sides thereof to afford contact between the extending ends of the bands and a mattress pad or the like placed on the mattress top, and means carried by each of the bands at the extending ends thereof for releasably attaching the bands to the pad or the like whereby the pad is releasably held in a predetermined position on the mattress top.

4,222,140

BOARDING PLATFORM

William J. Olewinski; Teddy G. Smith, and John L. Papizan, all of Baton Rouge, La., assignors to F. C. Schaffer & Associates, Inc., Baton Rouge, La.

Filed Feb. 23, 1979, Ser. No. 14,562
Int. Cl.[2] E01D 1/00
U.S. Cl. 14—71.3 17 Claims



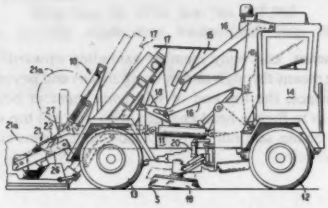
8. A boarding platform for transporting personnel between a fixed dock structure and a barge or the like, comprising vertical track means comprising a pair of parallel, vertical columns, boarding platform means including a carriage movable along said track means and having rollers coacting with said columns, said boarding platform means further comprising a ramp portion, locking means comprising a series of pins projecting from said columns which are engageable by solenoid-operated locking dogs on said platform means, a cable for raising and lowering said platform means and for carrying a portion of the weight of said platform means, said cable being connected to a load cell which in turn is connected to said platform means, counterweights supporting the remainder of the weight of said platform means, said locking means being responsive to signals generated by said load cell to operate said locking dogs, said load cell being responsive to increases and decreases in the weight of said platform means to generate said signals (a) when a person stands on the ramp portion, (b) if said cable breaks, or (c) if one or more of said counterweights releases.

4,222,141

STREET SWEEPER AND MAIN BROOM SUSPENSION

Gerald N. Kieft, St. Charles, and Donald L. Hildebrand, Union, both of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Filed May 4, 1979, Ser. No. 36,008
Int. Cl.[3] E01H 1/04
U.S. Cl. 15—84 13 Claims



1. In a self-propelled street sweeper including a main frame, sweepings pick-up means underlying the main frame and a dirt box positioned on the frame for receiving the sweepings, the improvememt comprising:

a main broom structure including a main broom mounted at a rear end of said main frame adapted to sweep sweepings to the sweepings pick-up means so the sweepings can be deposited into the dirt box and having sweeping and road travel positions;

means for driving said main broom when in its sweeping position;

means for suspending the main broom from the rear end of said main frame including suspension arms located on opposite sides of said main broom;

bearing means between said suspension arms and said opposite side of said main broom; and

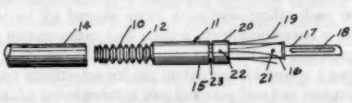
floating suspension means operatively connected between said main broom and said main frame providing a floating suspension for enabling said main broom to freely float on a ground supporting surface as the main broom is dragged behind said main frame in road engagement, said suspension means including adjustable broom snubber means for providing controlled friction to at least one of said suspension frames for minimizing any tendency of the broom to bounce when in its sweeping position, and a stop chain and an extension spring cooperable together and with said main broom to allow the main broom to follow the contour of a depression or dip in a road surface being swept.

4,222,142

GUN CLEANING DEVICE

Peter DiProspero, 814 W. 25th St., Erie, Pa. 16502

Filed Jan. 15, 1979, Ser. No. 3,359
Int. Cl.[2] F41C 31/00
U.S. Cl. 15—104.165 1 Claim



1. A gun cleaning tip (10) comprising a body (11) having a threaded end (12),

said threaded end (12) being adapted to be received in the threaded end of a cleaning rod (14),

a second end (17) having a slot (18) therein,

said body (11) having an enlarged part (15) integrally connected to said threaded end (12) and reduced size part (16) integrally connected to said enlarged part (15) and to said second end (17),

bristles having one end connected to said enlarged part (15) and terminating adjacent said second end,

a sleeve slidably received on said reduced size part and disposed around said bristles and slidable from a position adjacent said enlarged part (15) to a position adjacent said second end (17) and detent means (22) on said sleeve adapted to cooperate with detent means (21) on said reduced size part holding said sleeve selectively in a position adjacent said second end (17) to a position adjacent said enlarged part (15) whereby the ends (19) of said bristles are selectively held to said reduced size part so the user can selectively provide a cloth patch in said slot for cleaning the gun or can slide said sleeve to a position to allow said bristles to fan outward for cleaning said gun with said bristles.

4,222,143

INTERPROXIMAL BRUSH HANDLE

Emanuel B. Tarrs a, Chicago; Steven Tisma, Niles, and Robert B. Staubitz, Chicago, all of Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Mar. 16, 1979, Ser. No. 21,116

Int. Cl.³ A46B *3/08, 3/18*

U.S. Cl. 15—105 **12 Claims**

1. An elongated interproximal brush handle having a transverse bore near at least one tip end thereof, the diameter of said bore being slightly greater than the diameter of a twisted pair of wires of a twisted wire brush, a locking area formed in said handle and extending away from said transverse bore, the area beginning at a shoulder and thereafter sloping downwardly to an end removed from said bore, said shoulder being formed to a depth in said handle which exposes said twisted wire above the surface level of the handle, the depth of the area end removed from said bore being low enough to enable an end of said twisted wire to be bent over said shoulder and pressed below the surface level of said handle, and a sleeve for sliding over said end of said twisted wire to come to rest against the twisted wire which is exposed above said surface of said handle where the wire is bent over said shoulder.

4,222,144

BLOWING APPARATUS FOR REMOVING SOOT

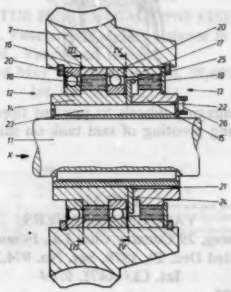
Gerhard Hörner, Mannheim, and Kurt Köhler, Beindersheim, both of Fed. Rep. of Germany, assignors to Bergemann GmbH, Wesel, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,226

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757981

Int. Cl.³ F23J *3/02*

U.S. Cl. 15—317 **4 Claims**



1. A blowing apparatus for removing soot, comprising:

(a) tubular lance means for discharging a pressurized blowing medium against surfaces to be cleaned,

(b) motor means to provide power for axially and rotatably displacing said lance means,

(c) drive wheel means drivingly connected to said motor,

(d) drive shaft means drivingly connectable to said drive wheel means,

(e) first free wheel means connected between said drive wheel means and said drive shaft means to drivingly entrain said drive shaft means when said drive wheel means is driven in a given rotational sense,

(f) second free wheel means connected between said drive wheel means and said drive shaft means to drivingly entrain said drive shaft means when said drive wheel means is driven in a rotational sense opposite to said given rotational sense,

(g) lost motion connection means between said second free wheel means and said drive shaft means to provide a driving lag between said second free wheel means and said drive shaft means, and

(h) rotary motion of said drive shaft means being converted to axial motion of said tubular lance means.

4,222,145

VACUUM CLEANER CARRIAGE AND TANK ASSEMBLY

Dale E. Lowder, North Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Nov. 2, 1977, Ser. No. 847,905

Int. Cl.³ B62B *3/08*

U.S. Cl. 15—353 **20 Claims**

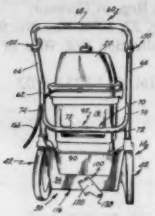
16. A vacuum cleaning system, comprising:

a suction device;

a vacuum cleaning apparatus collection tank, said tank supporting said suction device, said collection tank including a transversely extending pivot member defining a rearwardly and downwardly opening groove;

a carriage including a carriage base defining a platform dimensioned to support said tank, a pair of ground engaging wheels positioned on said carriage base adjacent yet spaced from the rear transverse edge of said carriage base, a pair of spaced members extending upwardly from opposite sides of said carriage base, and a pivot support rod extending between said spaced members, said rod dimen-

sioned to be received in the groove of said pivot member of said tank, and anti-tilt means secured to said carriage for providing a three-point support in conjunction with said



ground engaging wheels to prevent tipping of said carriage during pivoting of said tank on said pivot support rod.

4,222,146

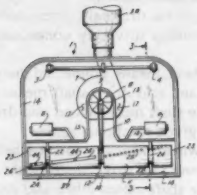
VACUUM CLEANERS

Samuel Hertzberg, 29 Country Club La., Pomona, N.Y. 10970

Filed Dec. 29, 1978, Ser. No. 974,338

Int. Cl.[2] A47L *9/04*

U.S. Cl. 15—392 **11 Claims**



1. In a vacuum cleaner, a combination consisting of a general housing, a brush roll, a pair of aligned bearings, and a conforming guard plate: the brush roll revolvable subject to the application of torque supported in the general housing by the bearings, each bearing on its own supporting members on the general housing encircling the brush roll at a selected segment adjacent a respective brush roll end; at least one of the said bearings positioned sufficiently intermediate its brush roll end and the center of the brush roll to render the said brush roll end freely protruding through the bearing toward an interior surface of the general housing; a cutout in the general housing of substance contiguous to the aforementioned brush roll end sufficient to allow the brush roll end to project into and to revolve unimpeded in space formed by the said cutout; and the guard plate rigidly secured to the undercarriage of the general housing.

4,222,147

DOOR CLOSER WITH ASSIST OR DOOR OPERATING FEATURES

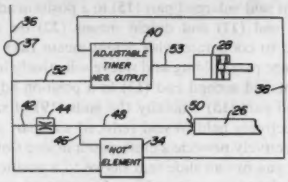
L. Nelson Burnett, Jr., Pottstown, Pa., assignor to Reading Door Closer Corp., Reamstown, Pa.

Filed Mar. 20, 1978, Ser. No. 888,217

Int. Cl.[2] E05F *3/00*

U.S. Cl. 16—62 **13 Claims**

1. Hydraulic door closer apparatus comprising a housing having a cylinder therein, a piston disposed in said cylinder, force transmitting means operatively coupled to said piston for transmitting forces to and from said piston to control movement of a door, biasing means in said cylinder in force-transmitting engagement with said piston for biasing said piston toward a rest position, actuator means operatively coupled to said piston for selectively applying to said piston force in opposition to said biasing means, and control means operatively coupled to said actuator means for selectively operating said actuator means, said actuator means being so configured and arranged as to be capable of providing a force in excess of



the force of said biasing means, and said control means comprising means coupled to said actuator means for normally causing said actuator means to provide a force in opposition to said biasing means approximately equal to the force of said biasing means so that the effect of said biasing means is nearly balanced and manual opening of a door facilitated thereby, and said control means further comprising selectively operable means for selectively causing said actuator means to provide a force in opposition to said biasing means in excess of the force of said biasing means so that the force of said biasing is overbalanced and the door caused to be opened.

4,222,148

SPECTACLE HINGE

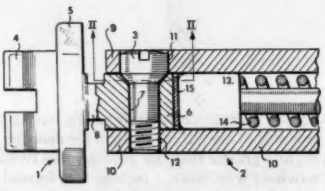
Conrad Zellweger, Chene-Bougeries, and Joseph Biondina, Bernex, both of Switzerland, assignors to La Nationale S.A., Geneve, Switzerland

Filed Dec. 14, 1978, Ser. No. 969,330

Claims priority, application Switzerland, Dec. 22, 1977, 15856/77

Int. Cl.[2] G02C *5/22*

U.S. Cl. 16—128 A **4 Claims**



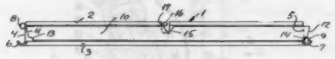
1. A spectacle hinge comprising first and second parts, said first part including a projection and a cam member, the second part comprising a cam follower button, a spring urging said button against the cam member, the first hinge part being made of a ductile metal, the cam member of the first hinge having a hardness greater than that of the first hinge part, said cam member comprising a strip of which the outer face comprises the cam surface and the inner face is of the same shape as the outer surface of the projection of the first hinge part and encloses said projection.

4,222,149

DOOR HINGE ARRANGEMENT PERMITTING OPENING OF THE DOOR ALTERNATIVELY AT EITHER SIDE

Gert A. E. Holbek, Sovej 1, DK-2840 Holte, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,226
Int. Cl.[2] E05D *15/50*
U.S. Cl. 16—147 **4 Claims**



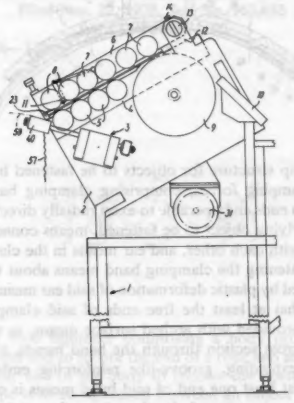
1. A door hinge arrangement permitting opening of the door alternatively at either side, comprising a mounting for attachment to the door at the upper edge thereof, and a mounting for attachment to the door at the tower end thereof, each mounting carrying two hinge seats for engagement with hinge pivots fixed to the frame of the door, a trapping member associated with each mounting, said trapping member being slidable longitudinally of the mounting in either direction from a middle position and having cam means so arranged and constructed that in the initial phase of the opening of the door at one side the cam means longitudinally slide each trapping member so as to trap the corresponding hinge pivot in the hinge seat at the other side of the door, the hinge seats (**6**, **7**; **27**, **28**; **48**, **49**) being located at the outer ends of the mountings (**1**; **20**; **41**), and the trapping members (**10**; **22**; **40**) having a length not exceeding the distance between the outer ends of the hinge seats and being such as to be displaced by the cam means in the direction away from the side at which the door is being opened.

4,222,150

SAUSAGE PEELING APPARATUS

Erik Andersen, No. 3 Axel Juels Alle, 2750 Ballerup, Denmark

Filed Apr. 3, 1979, Ser. No. 26,554
Claims priority, application Denmark, Apr. 10, 1978, 1576/78
Int. Cl.[3] A22C *11/00, 13/00*
U.S. Cl. 17—1 F **10 Claims**



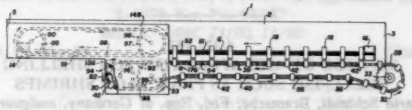
1. Apparatus for removing the casing from sausages, comprising feeding means for longitudinally advancing a continuous chain of sausages and a knife adapted to cut at least partially through the casing of each sausage in the chain in order to facilitate the removal thereof, wherein the improvement comprises a pair of rollers located downstream of said knife and defining between them an elongate roller nip located in a plane of symmetry between said rollers, means for rotating said rollers in opposite directions and such that in said roller nip the roller surfaces move away from that side of said nip where said feeding means is arranged, and said feeding means is shaped and arranged such as to direct the leading end of a sausage chain into contact with the roller surfaces along a path of movement located at least substantially in said plane of symmetry and including an obtuse angle with the longitudinal direction of said roller nip.

4,222,151

APPARATUS FOR EXTRACTING FISH ROE

James A. McKee, Vancouver, Canada, assignor to The Canadian Fishing Co. Ltd., Vancouver, Canada

Filed May 14, 1979, Ser. No. 38,609
Int. Cl.[3] A22C *25/14*
U.S. Cl. 17—52 **19 Claims**



1. An apparatus for extracting fish roe, comprising:
first means for holding a tail portion of a fish;
second means for holding a head portion of the fish;
a first blade;
a second blade;
means for moving the blades towards the fish to pierce the fish near the back thereof and between the first and second means; and
means for separating the first blade and the first means from the second blade and the second means generally in the direction of the backbone of the fish to tear the head portion from the tail portion and expose roe within the fish.

15. A method of exposing roe in fish comprising:
positioning a fish within a first means for holding a tail portion of the fish and a second means for holding a head portion of the fish;
piercing the fish between the back and the backbone thereof and between the first and second means with two adjacent blades;
moving a second said blade and the second means away from a first said blade and the first means generally in a direction parallel to the backbone of the fish to tear the fish into two portions and expose the roe.

4,222,152

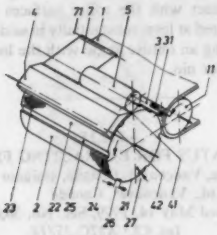
APPARATUS FOR THE SKINNING OF FISH FILLETS

Horst Braeger, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,450
Int. Cl.[3] A22C *25/17*
U.S. Cl. 17—62 **13 Claims**

1. An apparatus for skinning fish fillets, comprising a rotatable skinning roller, conveyor means for advancing the fillet to the skinning roller, and a skinning knife provided with a cutting edge at a fixed distance from and a presser face equispaced from the periphery of the skinning roller, wherein the periphery of the skinning roller is provided
(a) with recess means distributed over the circumference of said skinning roller and extending from one end face of the latter to the opposite end face and
(b) with lands enclosed between said recess means for transporting the fillet and supporting it at the skin side thereof,

each of said lands, when measured in the direction of the circumference of said skinning roller, having a width



which is a multiple of the width of each of said recess means.

4,222,153

METHOD OF AND APPARATUS FOR SHELLING SHELLFISH SUCH AS PRAWNS OR SHRIMPS

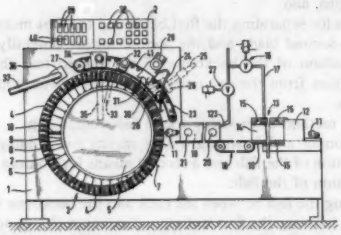
Karin Schmidt, Bramsche, Fed. Rep. of Germany, assignor to Firma Geba Geratebau GmbH, Bramsche, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 972,122

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758233

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—73 **15 Claims**



1. Apparatus for mechanically shelling prawns, comprising a prawn holder, a feeder device for the continuous positioned supply of individual prawns to the prawn holder, a clamping device operative on the propelling tail of each prawn located in the holder, at least one guiding and spreading element for extending and straightening the clamped prawn, a cutter mechanism which at least partly cuts off the head, a first removal device for removing the head of the prawn, a second removal device for pulling the meat out of the beheaded prawn, and a third removal device for removing the empty shell of the prawn, the prawn holder being arranged to travel past the removal device.

4,222,154

FIBRE FLOCK MATERIAL FEED APPARATUS FOR OPENING ROLLS

Paul Stäheli, Wilen near Wil, and Paul Welti, Winterthur, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jul. 10, 1978, Ser. No. 922,816

Claims priority, application Switzerland, Jul. 18, 1977, 8850/77

Int. Cl.² D01G *15/40, 23/00*

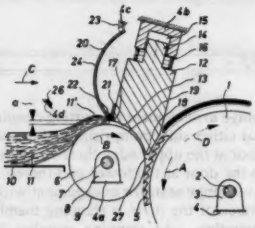
U.S. Cl. 19—105 **16 Claims**

1. A feed apparatus for a fibre layer on an opening roll of cards or spinning preparatory machines fed with the fibre layer moving in a predetermined direction of travel, comprising:

a feed roll;

a feeder plate having an entrance;

said feeder plate together with said feed roll being positioned to form therebetween a clearance extending from the entrance of the feeder plate;



a presser member arranged at said entrance to and immediately upstream of the feeder plate with respect to the direction of movement of the fibre layer;

means for mounting said presser member to be movable towards the feed roll into a position for compressing the fibre layer and at least to a distance essentially corresponding to the width of said clearance at the entrance of the feeder plate.

4,222,155

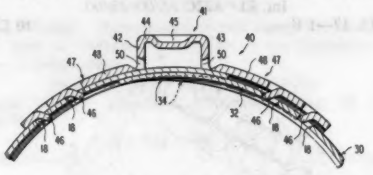
HOSE CLAMP

Hans Oetiker, Oberdorfstrasse 21, Horgen, Switzerland

Filed Nov. 1, 1978, Ser. No. 956,503

Int. Cl.² B65D *63/02*

U.S. Cl. 24—20 R **34 Claims**



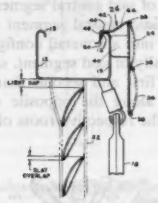
1. A clamp structure for objects to be fastened by radially directed clamping forces, comprising clamping band means having open ends and operable to exert radially directed forces on an underlying object to be fastened, means connecting the open ends with each other, and ear means in the clamp structure for tightening the clamping band means about the object to be fastened by plastic deformation of said ear means, characterized in that at least the free ends of said clamping band means are provided with arched surface means, as viewed in transverse cross section through the band means, to provide outwardly extending, groove-like reinforcing embossments, and in that at least one end of said band means is of tapered configuration, as viewed in the circumferential direction thereof, with the tapering side surfaces converging toward each other in the direction toward the respective band end so that the arched surface means of said one band end are able to engage in overlying arched surface means near the other band end to assure thereby a continuously smooth, stepless internal configuration of the band means during tightening thereof by contraction of the ear means as the diametric dimension is reduced.

4,222,156

HOLDER FOR SUPPORTING A VALANCE AT A VENETIAN BLIND HEAD

Joseph A. Anderle, Clifton, N.J., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.

Filed Dec. 22, 1977, Ser. No. 863,243
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—73 B **2 Claims**



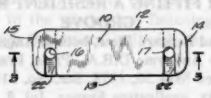
1. An article of manufacture for use in connection with a venetian blind, comprising: a body of substantially flat sheet metal having means for supporting at least one valance in a substantially horizontal position, said supporting means comprising three spaced prongs protruding from said body and substantially in vertical alignment with each other, said body also having means for connecting said body to a support, said connecting means comprising a plurality of tabs adapted to engage complementary openings in said support, said tabs extending from the plane of said flat sheet metal body in a direction opposite to said prongs and substantially at right angles to the plane of said flat sheet metal body, each of said tabs being provided with a substantially centrally extending slot, whereby each tab may yield and be compressed towards the center of the respective tab when entering a complementary opening.

4,222,157

ROPE TIGHTENER

Hugh M. Forman, Waukesha, Wis., assignor to David C. Fisher and Mary F. Fisher, both of Fresno, Calif.

Filed Nov. 22, 1978, Ser. No. 962,853
Int. Cl.² F16G *11/00*
U.S. Cl. 24—129 A **5 Claims**



1. In a rope tightener comprising a body provided with means at one end to secure the end of a rope and at least a hole at the other end of the body to receive the center of a rope which rope is to be tightened between an object holding the loop of rope between the center and secured end and another object attached to the free end of the rope, the improvement comprising:

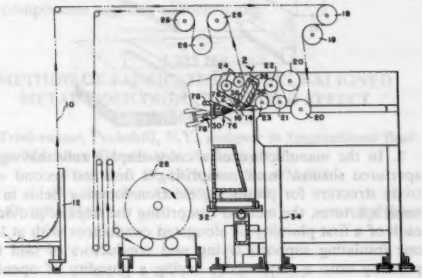
a pair of legs each having a surface adjacent the other leg in the unstressed position of said legs, each said leg being provided with a slot all the way through the thickness of the material of the leg and extending from the side of the leg over the slot of the other leg, the respective legs having their respective slots extending from opposite sides and said slots cooperating to form a hole for reception of said rope, said sides or legs being capable or resilient deflection to permit a rope to pass between the legs.

4,222,158

PILE FABRIC SCULPTURING APPARATUS

Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 904,111, May 8, 1978. This application Jul. 2, 1979, Ser. No. 53,987
Int. Cl.² D06C *23/00, 13/00*
U.S. Cl. 26—16 **1 Claim**



1. An improved apparatus for trimming the pile in regions of a pile fabric to which stiffening agent has been applied, said apparatus being of the type having:

means for supplying a pile fabric having regions of stiffened and unstiffened fibers; and

cutter means for trimming the pile from the stiffened regions, including;

a frame,

blade means mounted on said frame for contacting both the stiffened and unstiffened fibers while severing the stiffened fibers and deflecting the unstiffened fibers, said blade means cutting in the same fashion as a knife or razor as opposed to cutting like a pair of scissors, said blade means being in the form of an endless translating flexible band;

support means mounted on said frame closely adjacent to said blade means for maintaining said pile fabric in contact with said blade means; and

means for effecting relative motion between said blade means and said pile fabric;

said support means comprising:

a plurality of adjustable roller means mounted on said frame

a substantially cylindrical support member comprising:

a substantially cylindrical core member;

a plurality of hardened smooth ring members surrounding said core member;

a plurality of knurled ring members surrounding said core member; and

means for retaining said ring members on said core member;

said core member being rotatably supported by said roller means and said hardened smooth rings coinciding with said roller means.

4,222,159
METHOD OF MANUFACTURING A COLOR DISPLAY TUBE SHADOW MASK

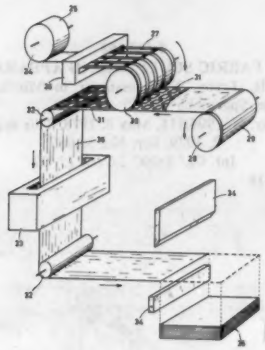
Jacob Koorneef, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 893,939, Apr. 6, 1978, abandoned, which is a continuation of Ser. No. 759,112, Jan. 13, 1977, abandoned. This application May 4, 1979, Ser. No. 35,951

Claims priority, application Netherlands, Jan. 16, 1976, 7600418

Int. Cl.³ H01J *9/14, 9/02*

U.S. Cl. 29—25.14 **11 Claims**



1. In the manufacture of a color display tube having an apertured shadow mask comprising a first and second electrode structure for producing electron focusing fields in the mask apertures, the method comprising the steps of providing each of a first plurality of elongated conductors with at least one insulating support, laying said conductors of said first plurality onto a metal sheet having a plurality of openings defining a second plurality of elongated, substantially parallel conductors therebetween so that said conductors of said first plurality are spaced and electrically insulated from said sheet by said supports, extend transversely of said conductors of said second plurality and are spaced from each other to define a plurality of openings therebetween which are aligned with at least portions of said openings in said sheet to thereby form apertures for passage of electrons, securing said supports to said metal sheet to thereby form said shadow mask, said conductors of said first and second plurality defining said first and second electrode structures, respectively, such that, upon application of a potential difference therebetween, electron focusing fields are produced in said apertures, and mounting said shadow mask in an envelope of said display tube.

4,222,160
METHOD OF MAKING HEAT EXCHANGE TUBING ASSEMBLY

Leo J. Kerivan, Wellesley, Mass., assignor to Industrial Blast Coil Corporation, South Easton, Mass.

Division of Ser. No. 781,925, Mar. 28, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,520

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 A **15 Claims**

1. The method of fabricating a multiple bladed heat exchange tubing comprising the steps of:

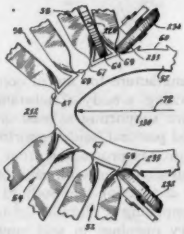
providing a strip of sheet metal stock;

shearing each edge of said strip with a plurality of uniformly spaced slits extending inwardly from the edge toward a generally planar, longitudinally extending, unslit, central segment of the strip for forming first and second pluralities of immediately adjacent blades located along opposite sides of said central segment and being integrally attached to said central segment;

twisting said blades of both pluralities about their own axes near their respective roots for orienting said blades into planes generally normal to said central segment;

advancing said central segment longitudinally through a forming station for progressively deflecting the sheared and twisted blades of said first and second pluralities toward each other in a direction approximately normal to the original plane of said central segment for forming said central segment with its integrally attached twisted blades into a generally U-shaped configuration as seen looking longitudinally of said central segment;

further forming said central segment and the roots of said twisted blades into a dovetail configuration as seen looking longitudinally of said segment, said dove-tail configuration having first and second sharp corners extending longitudinally along the opposite sides of said central segment near the respective roots of the blades;



forming a tube having first and second ridges projecting from the exterior surface of the tube and being integral with the tube, extending parallel and longitudinally thereof;

positioning said bladed strip with the bottom surface of said central segment in contact with the exterior surface of the tube between said first and second ridges and with said first and second corners of said dovetail configuration being located immediately adjacent to said first and second ridges, respectively; and

mechanically deforming at least one of said ridges inwardly toward said bladed strip and downwardly in a direction toward the exterior surface of the tube between said ridges for captivating said bladed strip between said ridges with the bottom surface of said central segment being firmly pressed into contact with the exterior surface of the tube between said ridges.

4,222,161
TOOL FOR FITTING A RESILIENT RING INTO A GROOVE

André Duval, and Bernard Lime, both of Angers, France, assignors to Societe Anonyme D.B.A., Paris, France

Filed May 30, 1978, Ser. No. 910,551

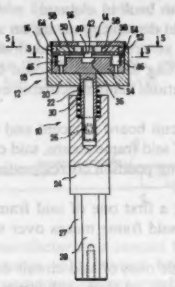
Claims priority, application France, Jul. 8, 1977, 77 21115

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 **7 Claims**

1. A tool for fitting a ring seal into a groove defined in a bore comprising a receptacle having a cylindrical portion in which there is defined a space capable of receiving the seal, at least one external member cooperating with the seal to deform the seal within the space, the diameter of the cylindrical portion being greater than the maximum external dimensions of the seal after deformation and smaller than the diameter of the bore, the tool also comprising a movable member having a tubular portion slidable on the cylindrical portion and normally urged to a position opposite the space by first resilient means, at least one aperture being formed in at least one of the said portions to allow the external member to pass through when the tubular portion is opposite the space, expulsion means provided in the space to urge the seal into its natural

annular position when the tubular portion is offset relative to the space against the action of said resilient means, and said



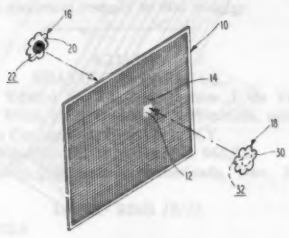
expulsion means includes at least one element slidable in a slot in the cylindrical portion and urged towards an end of said slot by second resilient means.

4,222,162

SCREEN REPAIR

Mark A. Levy, 8605 SW. 147 Ter., Miami, Fla. 33134, and Jack R. Tester, 8340 SW. 164 St., Miami, Fla. 33126

Filed Nov. 29, 1978, Ser. No. 964,690
Int. Cl.[3] B23P 7/00
U.S. Cl. 29—402.09 15 Claims



1. A patching system for repairing a screen having a defect in it, said system including two patches adapted to be positioned on opposite sides of said screen, each patch including a cover section adapted to overlie the defect and mechanical fastening means adapted to face inwardly toward the screen, the mechanical fastening means of one patch being mechanically connectable to the mechanical fastening means of the other patch through the screen and with the cover sections overlying the defect.

4,222,163

METHOD FOR AUTOMATICALLY ASSEMBLING ARTICLES, SUCH AS CLIPS

Maurice Wolfthal, Ossining, N.Y., assignor to Stewart Stamping Corp., Yonkers, N.Y.

Division of Ser. No. 851,516, Nov. 14, 1977, Pat. No. 4,173,824. This application Apr. 4, 1979, Ser. No. 26,955
Int. Cl.[3] B23P 17/00
U.S. Cl. 29—417 2 Claims

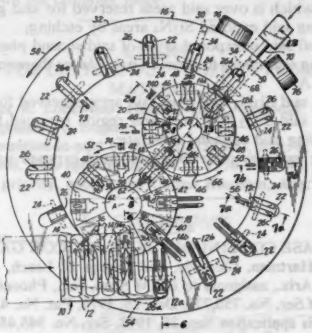
1. A method for manufacturing clips including first and second clip components comprising the steps of:

forming first and second clip components from a single piece of metallic stock;

holding said first and second clip components in an apparatus in a horizontal attitude;

pivoting said first and second clip components into a vertical attitude;

indexing said first and second clip components into confronting relationship; and



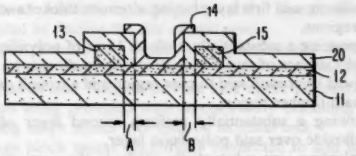
assembling each pair of confronting first and second clip components together to form a clip.

4,222,164

METHOD OF FABRICATION OF SELF-ALIGNED METAL-SEMICONDUCTOR FIELD EFFECT TRANSISTORS

Sol Triebwasser, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,592
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—571 8 Claims



1. A method of fabricating self-aligned MESFET devices including the steps of:

providing a semiconductor body having an epitaxial layer of opposite polarity deposited there on;

growing of said epitaxial layer a layer of SiO_2, said layer of SiO_2 being between about 100 A to 1000 A;

depositing onto said SiO_2 layer a layer of Si_3N_4, said layer of Si_3N_4 being between 200 A and 1000 A;

applying a first photoresist layer on said layer of Si_3N_4, the thickness of the photoresist being between about 5000 A to 10,000 A;

selectively exposing said first photoresist layer and developing to provide patterned opening exposing regions for sources and drains on said Si_3N_4 layer;

etching to remove said exposed Si_3N_4 regions for sources and drains;

continuing said etching to remove said SiO_2 layer beneath said exposed regions of said Si_3N_4 exposing regions of said epitaxial layer;

evaporating doped Si onto exposed regions of said epitaxial layer;

lifting off said unexposed first photoresist layer leaving doped mesas for sources and drains with the area therebetween being reserved for subsequent deposition of gates;

applying a second photoresist layer to said Si_3N_4 and said doped semiconductor mesas; thickness of said second

photoresist layer thickness being between about 5000 A and 10,000 A;

selectively exposing said second photoresist layer and developing to expose areas of said Si_3N_4 and said mesas while leaving intact said second photoresist layer on the Si_3N_4 film which is over said areas reserved for said gates;

removing said exposed Si_3N_4 areas by etching;

lifting off said unexposed layer of said second photoresist;

oxidizing said mesas to form an oxide layer thereon of about 2000 A;

etching said Si_3N_4 film over said areas reserved for gates;

etching said SiO_2 film from said region reserved for gates, exposing said epitaxial substrate;

forming gates by patterning onto said exposed substrate a metal.

4,222,165

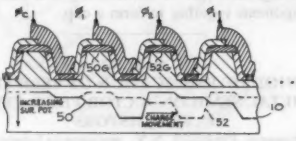
TWO-PHASE CONTINUOUS POLY SILICON GATE CCD

John M. Hartman, Glendale, and George S. Leach, Phoenix, both of Ariz., assignors to EMM Semi, Inc., Phoenix, Ariz.

Division of Ser. No. 750,774, Dec. 15, 1976, Pat. No. 4,156,247. This application Sep. 25, 1978, Ser. No. 945,453

Int. Cl.³ B01J *17/00*

U.S. Cl. 29—579 **4 Claims**



1. The method of fabricating a two-phase charge coupled storage device comprising:

growing a first layer of silicon dioxide on a substrate of silicon, said first layer having alternate thicker and thinner regions,

depositing a substantially uniform layer of polysilicon over the surface of said first layer of silicon dioxide to define a peak over each said thicker region and a trough over each said thinner region,

growing a substantially uniform second layer of silicon dioxide over said polysilicon layer,

implanting ions substantially solely in the portions of said polysilicon layer which are at the peaks and troughs regions to render said portions of said polysilicon layer conductive relative to the regions therebetween.

removing those portions of said second silicon dioxide layer which extend from an end portion of each peak down to and almost through the adjacent trough to present a plurality of windows to the polysilicon layer,

depositing a conductive metal layer in each of said windows in contact with the polysilicon layer and extending over a portion of the second silicon dioxide layer adjacent each of said windows.

4,222,166

METHOD AND APPARATUS FOR LOADING CIRCUIT BOARDS

Harry F. Kurek, 650 Taylor St., Sunnyvale, Calif. 94086, and Austin R. Silvester, Cupertino, Calif., assignors to Harry F. Kurek, Sunnyvale, Calif.

Filed Jun. 2, 1978, Ser. No. 911,849

Int. Cl.² H05K *3/30*

U.S. Cl. 29—831 **8 Claims**

1. A method for manually loading a circuit board with dual-in-line-type integrated circuit devices employing a programmable apparatus which comprises at least one rack disposed adjacent a loading position, at least one substantially planar frame means adapted to be laterally slidably mounted to said rack, and at least one means for serially dispensing said circuit devices and adapted to be attached at horizontal locations to said frame means, said method comprising the steps of:

(a) filling said dispensing means with said circuit devices aligned front to back in a queue;

(b) mounting said dispensing means on selected ones of said frame means at preselected locations corresponding to defined mounting locations for said circuit devices, said mounting locations being specifiable in a Cartesian coordinate system;

(c) placing a circuit board adjacent said rack and below the sliding path of said frame means, said circuit board having device-receiving position corresponding to said mounting location;

(d) withdrawing a first one of said frame means from said rack to place said frame means over said mounting location;

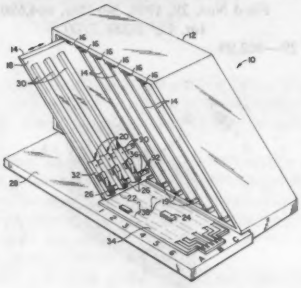
(e) releasing single ones of said circuit devices through said dispensing means on said withdrawn frame means into said access positions;

(f) removing each one of said released circuit devices from said access positions; and

(g) placing said removed circuit devices in the device-receiving positions corresponding thereto.

3. An apparatus for use in manually loading dual-in-line-type integrated circuit devices onto a circuit board disposed in a receiving area, said apparatus comprising:

a rack disposed adjacent said receiving area;



a plurality of means for manually dispensing selected ones of said circuit devices from a queue, each one of said dispensing means including means for supporting a tubular container which is for holding said circuit devices end to end, said dispensing means further including means for releasing only single ones of said circuit devices from said containers to an access position and supporting only single one of said devices from said queue at said access position; and

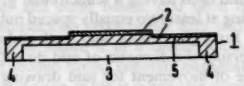
a plurality of substantially planar frame means, each one of said frame means being slidably mounted to said rack in an inclined, closely-spaced array, each rack including means for supporting, along its lower horizontal edge, a plurality of said dispensing means in substantially one angularly downwardly inclined plane, wherein the access position of said dispensing means is adjacent said lower edge of said frame means, each said frame means being movable from a first position within said rack to a second position over said receiving area, said rack and said frame means being substantially devoid of obstacles between said receiving area and said access position such that each single circuit device, in its respective queue, is vertically aligned with a defined horizontal matrix location of said receiving area for transferring each single circuit device from said access position to a corresponding vertically aligned underlying device receiving position in said receiving area.

4,222,167

METHOD OF MANUFACTURING A CONTACT BRIDGE

Heinrich Hässler, Wendelstein; Joachim Grosse, Erlangen; Gert Fischer, and Joachim Hannich, both of Amberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,961
Int. Cl.³ H01R 43/00
U.S. Cl. 29—875 2 Claims



1. A method of manufacturing a contact bridge for an electric switching apparatus, said contact bridge including an electrically highly conductive copper overlay and a concave-shaped iron support layer, comprising the steps of sequentially

pressing a powder blank at a pressure of between about (200 and 400)$\times 10^6$ Newton/m^2 comprising two layers of metallic material, one of said layers comprising predominantly of iron and one of said layers comprising predominantly of copper, said iron layer comprising said support layer and said copper layer comprising said overlay;

sintering said blank in a protective gas at a temperature of about 1000° C.;

sizing said blank at a pressure of between about (600 and 1000)$\times 10^6$ Newton/m^2;

further sintering said blank in a protective gas;

further pressing said blank by reverse-flow cup extrusion; and thereafter

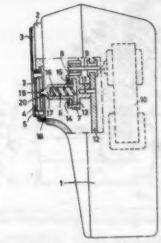
applying an electrical contact to said overlay.

4,222,168

SHAVING APPARATUS

Ebbe Boiten; Eduard W. Tietjens; Jochem J. de Vries, and Tjamme de Vries, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 966,833
Claims priority, application Netherlands, Nov. 14, 1978, 7811228
Int. Cl.² B26B 19/16
U.S. Cl. 30—43.6 1 Claim



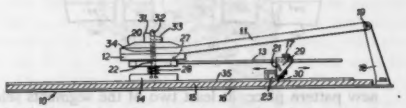
1. A shaving apparatus having a circular shear plate provided with hair-entrance apertures and a cutting unit associated with and rotatable relative to the shear plate; said cutting unit comprising a cutting member having a circular central body, cutters extending from the circumference of said central body toward the shear plate, lead cutters respectively associated with and movable relative to the cutters, each lead cutter, with reference to the direction of rotation of the cutting unit, being positioned in front of its associated cutter, a hair-pulling member having a circular central plate-shaped portion, respective connecting arms securing the lead cutters to the circumference of the central plate-shaped portion, and a coupling piece for securing the cutting member and the hair-pulling member together, said central body and said central plate-shaped portion each having a central opening for reception of the coupling piece, the central plate-shaped portion at the periphery of its central opening being provided with at least one substantially radially inwardly directed connection tab for contact with the coupling piece.

4,222,169

CUTTER FOR CUTTING OUT PROFILES FROM SHEET MATERIAL

Christopher R. Lockwood, Hunters Oak, Asheridge, Chesham, Buckinghamshire, England

Continuation-in-part of Ser. No. 822,882, Aug. 8, 1977, abandoned. This application Nov. 1, 1978, Ser. No. 956,785
Claims priority, application United Kingdom, Aug. 10, 1976, 33252/76
Int. Cl.³ B26B 29/00
U.S. Cl. 30—286 4 Claims



1. A cutting apparatus for cutting out profiles from sheet material, comprising in combination:

(a) arm means having an elongated slot at one end thereof and being provided with a follower pin proximate said slot;

(b) cutting means mounted on the other end of said arm means;

(c) lower pressure pad means having a lower surface adapted to come into pressure contact with said material, said lower pressure pad means being provided with a centrally disposed fulcrum extending upwardly therefrom and adapted to receive the slot of said arm;

(d) upper pressure pad means having a centrally disposed aperture therein adapted to receive and retain the upper portion of said fulcrum therein, said upper pressure pad means being provided with an outwardly extending arm having hinge means provided on its distal end;

(e) hinge block means operatively connected to said upper pressure pad means hinge means on one end and adapted to be affixed to a surface for receiving said material to be cut;

(f) cam means affixed to the lower surface of said upper pressure pad means, said cam means being provided with a plurality of grooves therein adapted to slidably receive said arm means follower pin; and

(g) spring means circumscribing said fulcrum and disposed between said pressure pad means and said one end of said arm means for retaining said follower pin in one of said plurality of grooves; whereby exerting pressure on said upper pressure pad causing said lower pressure pad to contact said material and rotating said arm means with said cutting means piercing material causes said material to be cut in a shape proportioned to said selected groove.

4,222,170

SEGMENTAL TECHNIQUE FOR SIZING GARMENTS

Kathleen B. Koontz, P.O. Box 27062, Denver, Colo. 80227

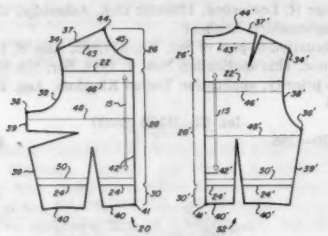
Filed Nov. 17, 1978, Ser. No. 961,631
Int. Cl.³ A41H 3/00
U.S. Cl. 33—17 R 10 Claims

1. A method of forming individually and specifically sized garment patterns utilizing segments of pattern pieces of a foundation pattern draft, the foundation pattern draft having a plurality of recognized predetermined overall sizes and each of the pattern pieces of the foundation pattern draft being of a size

identified by the overall size of the foundation pattern draft of which the pattern piece is an element, said method comprising:

dividing a plurality of the corresponding pattern pieces into a plurality of segments, the plurality of corresponding pattern pieces including pattern pieces of at least two different overall sizes, each segment being defined by at least one division line extending perpendicularly with respect to a vertical reference of the pattern piece;

selecting a number of segments necessary to form a complete



new pattern piece, at least two of the segments selected for completing the new pattern piece being divided from corresponding pattern pieces of different overall sizes;

joining the selected segments together at division lines to form a new pattern piece with segments thereof derived from at least two pattern pieces of different effective sizes; and

interpolating a new marginal outline for the new pattern piece in at least one area of the new pattern piece where two segments are joined together.

4,222,171

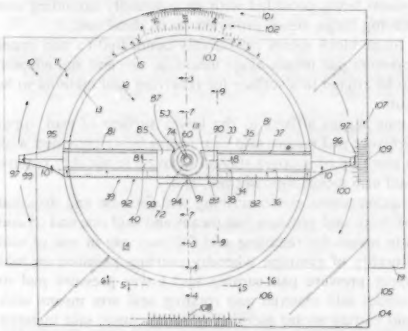
DRAFTING INSTRUMENT

Joseph J. Malacheski, 781 S. Main St., Wilkes-Barre, Pa. 18702

Filed Aug. 31, 1979, Ser. No. 71,783

Int. Cl.³ B43L *9/00*

U.S. Cl. 33—26 **8 Claims**



1. In a drafting instrument, the combination comprising a plate for positioning on one face of a worksheet and having a circular through opening having a countersink and having calibrated scales concentrically arrayed thereabout, a dish insertable in said circular through opening and rotable therein and having upstanding along its periphery a circular wall having a frustoconical flange, said plate and said dish having a connection means mutually interfitting for connectively combining said plate and said dish, the bottom of said dish being slightly above the bottom of said plate and thus being above said worksheet, a track having a handle at each end and comprising two parallel walls integral with and upstanding from the floor of said dish, a carriage for selective slidable movement along said track and having a locking means for selectively positioning said carriage along said track, a depressible plunger having a resilient means comprising a coil compression spring and carried by said carriage and extending through a through slot of said track, a drawing lead held by said depressible plunger and depending therefrom for selective drawing engagement with said worksheet, wherein the improvement comprises said connection means comprising a semicircular groove circuiting said circular wall and at least two equally spaced resilient members defined by through slots in said wall of said dish and each having a semicircular groove and a bead and comprising at least two equally spaced nubs on said wall of said circular through opening, said track and said through slot thereof traversing the diameter of said dish to allow said carriage a range of movement for said drawing lead to draw a straight line from one point on the perimeter of said dish to an opposite point on the perimeter of said dish, said track having a handle at each end for the manipulative rotation of said dish, said carriage having angled bottom sides for receptive conformability into said track having a valley of generally V-shaped cross-sectional outline defined by inner angled sides against which said angled bottom sides receptively conform for a positive seating of said carriage to ensure a positively smooth slidable movement of said carriage therein and to prevent said carriage of any vagrant movement therein regardless of any degree of wear experienced by said angled bottom sides and said valley, said carriage having a locking means for selectively positioning said carriage along said track while at the same time depressing said depressible plunger to bring said drawing lead into bearing engagement with said worksheet, said carriage having a centering means comprising two index lines at right angles for positioning center of said dish on a reference point of said worksheet, said depressible plunger having a feeding means for said drawing lead.

4,222,172

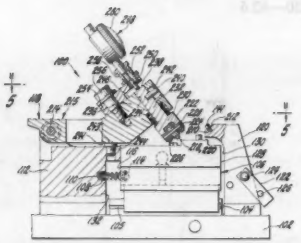
VANE AREA MEASURING DEVICE

George W. Mason, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1979, Ser. No. 2,933

Int. Cl.³ G01B *5/20*

U.S. Cl. 33—174 C **2 Claims**



1. A single airfoil throat area measurement apparatus for determining airfoil throat flow area of a vane or blade having an airfoil surface, inner and outer bands and radial plane reference surfaces, a side circumferential position reference surface, and a vertical height reference comprising: a movable gage carriage having spaced locating surfaces engageable with the radial plane reference surfaces for mounting an airfoil in a radial plane corresponding to an engine support annulus, a second locating surface on the carriage to locate the side reference surface of the airfoil at a position corresponding to that within the engine support annulus, means on the carriage to define an index for the vertical reference to locate the vane or blade in a vertical radial position corresponding to that within the engine support annulus, means for locking the vane or blade in contact with the locating surfaces, latch means interlocking with said carriage for holding the carriage in a vertical

height measuring position, first measurement means with indicator points thereon located within the inner and outer bands of the mounted airfoil to cause the indicator points thereon to be maintained against the inner and outer bands and including exposed surfaces normally aligned with one another to indicate a desired height datum between the inner and outer bands thereof, said first measurement means further including means for measuring misalignment of the exposed surfaces to indicate a variance of height from a desired vertical height datum between the inner and outer bands, said latch means being released out of interlocking relationship with said carriage to shift said carriage to locate it in a throat width measuring position, first and second throat registers engageable with the airfoil surface of said vane or blade when said carriage is in the throat width measuring position, one of said registers having two relatively movable outer surfaces thereon positioned with respect to one another when the carriage is in its throat width measurement position, and gage means on one of said last mentioned outer surfaces including means for indicating the throat width variation from a desired nominal throat width dimension whereby direct height and throat width variations can be determined prior to assembly of the airfoils in a ring in a gas turbine engine gas flow system.

4,222,173

SHAFT AND BORE MISALIGNMENT MEASUREMENT TOOL

John W. Hall, Lusby, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1978, Ser. No. 973,053
Int. Cl.³ G01B *5/25*
U.S. Cl. 33—180 R **17 Claims**

1. A tool for determining misalignment between the longitudinal axis of a rotatable shaft and the longitudinal axis of a coupling bore disposed in said rotatable shaft comprising:

means for engaging the wall of said coupling bore;

said engaging means comprise a plurality of radially expandable cylindrical members;

means, coacting with and carried by said engaging means, for expanding said engaging means into engagement with said wall so that the longitudinal axis of the tool is coincident with the longitudinal axis of said coupling bore; and

means coupled to said expanding means for indicating said misalignment;

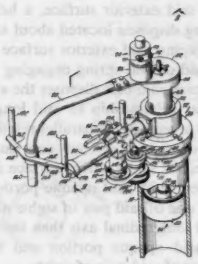
whereby misalignment between the longitudinal axis of the rotatable shaft and the longitudinal axis of the coupling bore may be determined by fixing the rotatable shaft against rotation and rotating said indicating means about said expanding means.

4,222,174

METHOD AND APPARATUS FOR GAGING AND JOINING PIPE

Ernest D. Hauk, 1315 E. 23rd St., Signal Hill, Calif. 90806; Thomas D. Hauk, 5313 Mezzanine Way, Long Beach, Calif. 90808, and Kenneth J. Carstensen, 1522 N. Muskingum, Odessa, Tex. 79761

Division of Ser. No. 792,568, May 2, 1977, which is a continuation-in-part of Ser. No. 728,148, Sep. 30, 1976. This application Sep. 8, 1978, Ser. No. 940,626
Int. Cl.³ G01B *3/14*
U.S. Cl. 33—199 R **52 Claims**



1. Apparatus for gaging a threaded pipe or collar element, comprising:

(a) a support having an axis and adapted to be detachably secured to said threaded element,

(b) a threaded gage mounted to said support for rotational and axial motion about and along said axis, and

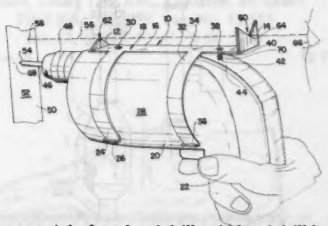
(c) marking means for marking said threaded element at a predetermined position relative to said gage.

4,222,175

ALIGNMENT SIGHT FOR HAND DRILLS

Joseph Bernicky, 7931 Austin St., Schererville, Ind. 46375

Continuation-in-part of Ser. No. 850,446, Nov. 10, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,516
Int. Cl.³ G01L *15/00*; F41G *1/00*
U.S. Cl. 33—263 **6 Claims**



1. An alignment sight for a hand drill, said hand drill having a chuck for receiving a drill bit therein, said drill bit defining a longitudinal axis when disposed clamped within said chuck, said alignment sight comprising an elongated rigid sheet, said sheet being disposed in a U-shape having a pair of legs joined together by a joining portion of said sheet, each leg of said pair of legs having an optically defined sight location thereon, a pair of sights, one of said pair of sights being disposed adjacent an end of said hand drill opposite the end thereof having said chuck thereon, each of said pair of sights including an opaque portion and a non-opaque portion, said sight location being disposed a fixed distance from said joining portion of said sheet, at least one band, said at least one band having ends, a portion of said at least one band fixedly secured to said joining

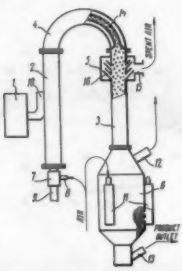
portion, said pair of legs and said ends of said at least one band being disposed having said joining portion thereinbetween, said at least one band being configured so as to clampingly removably engage the exterior surface of a portable drill machine, whereby a point coincident with said opaque portion and said non-opaque portion of one of said pair of sights and another point coincident with said opaque portion and said non-opaque portion of the other of said pair of sights define a line, said adjoining portion having a threaded hole therein, a bolt, said bolt threadingly engaged with said threaded hole, one end of said bolt extending outwardly from said joining portion in a direction opposite to the location of said legs and directed towards said exterior surface, a helical spring, said helical spring being disposed located about said bolt, one end of said spring engaging said exterior surface of said drill machine, the other end of said spring engaging said joining portion, whereby turning said bolt disposes the axis of said line at a preferred angular relationship to said longitudinal axis by adjusting said line in and out of parallel relationship with said longitudinal axis when said at least one band is clampingly removably engaged on said exterior surface and by disposing said point coincident with said opaque portion and said non-opaque portion of one of said pair of sights a greater or lesser distance from said longitudinal axis than the other said point coincident with said opaque portion and said non-opaque portion of the other of said pair of sights.

4,222,176

METHOD AND APPARATUS FOR DRYING GRANULATED DIELECTRIC MATERIALS

Nikolai A. Tjurin, Altufievskoe shosse, 18, kv. 297; Georgy V. Lysov, Teply Stan, mikroraion 9V, korpus 9ab, kv. 597; Anatoly S. Koriev, 2 Dorozhny proezd, 6, korpus 2, kv. 174; Nina L. Kuznetsova, Uzkoe, 26, kv. 8, and Anatoly T. Zamorenov, 1 Mosfilmovsky pereulok, 4, korpus 3, kv. 18, all of Moscow, U.S.S.R.

Filed Oct. 23, 1978, Ser. No. 953,439
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 **5 Claims**



1. A method for drying granulated materials, comprising the steps of

a. superhigh frequency heating of said granules,

b. providing a strong air flow in a heating space,

c. moving said granules at a variable speed through the heating space by using said air flow,

d. producing a temperature of said air flow that is 20° to 50° C. below the maximum temperature to which said granules are heated to create a negative temperature gradient $\Delta t = \overline{i} \cdot n \cdot 10°$ C., where i is the heat and mass transfer vector and n is a positive number,

e. removing spent moist air from the heating space, and

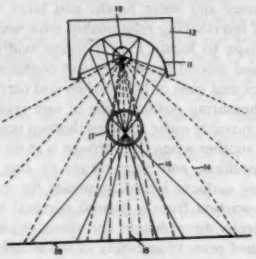
f. providing a continuous supply of fresh hot air.

4,222,177

APPARATUS FOR CURING PHOTO-DEVELOPING INKS

Ronald M. Mason, 6 Weerona Pl., Caringbah, New South Wales, Australia (2229)

Filed Mar. 20, 1978, Ser. No. 888,145
Claims priority, application Australia, Apr. 18, 1977, 9790/77
Int. Cl.[2] F27B *3/28*
U.S. Cl. 34—4 **15 Claims**



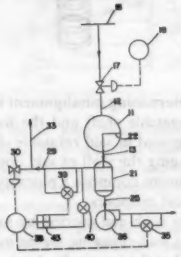
1. Apparatus to dry photodeveloping ink printed on sheet material, said apparatus comprising a housing, a sheet material conveyor passing through the housing, suction means in the housing to draw sheet material into contact with the conveyor whilst the sheet material is passing through the housing, a line source of ultra-violet light in the housing with the line of said source extending laterally across the conveyor and directing the rays therefrom toward the conveyor, reflector means to reflect ultra-violet rays from the light source onto the conveyor, a transparent heat sink filter for infra-red rays disposed between the conveyor and the ultra-violet light source and adapted for filtering between about 20% and 30% of the direct infra-red rays and substantially all of the reflected infra-red rays from the ultra-violet light source which would normally impinge on the conveyor within the housing.

4,222,178

METHOD AND APPARATUS FOR CONTROLLING A DRYING CYLINDER

Thomas L. Moran, Sylvania, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jul. 16, 1979, Ser. No. 57,638
Int. Cl.[3] F26B *3/24*
U.S. Cl. 34—41 **19 Claims**



1. An apparatus for controlling steam blow through flow rate for a drying cylinder, having a feed line to the cylinder, a means to remove fluids from within the cylinder, a discharge line from the drying cylinder connected to the fluid removal means, wherein the apparatus comprises:

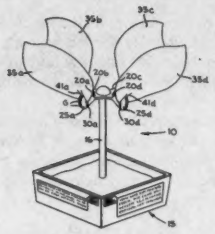
a means to control steam pressure in the feed line;

a steam/water separator connected to the discharge line;

a condensate discharge line from the steam water separator;

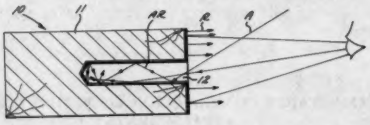
a means to measure condensate flow rate connected to the condensate discharge line and for emitting a signal in response to the measured flow rate;
a blow through steam line from the steam/water separator;
a means to measure blow through steam flow rate connected to the blow through steam line and for emitting a signal in response to the measured flow rate;
an atmosphere relief valve connected to the blow through stream line;
a ratio control means which receives signals from the means to measure blow through steam flow rate and from the means to measure flow rate and sends a signal to control the atmosphere relief valve based on the ratio of the signals received by the flow ratio controller.

4,222,179
DEVICE FOR AIDING IN THE SELECTION OF A BALANCED DIET
Roy W. Goody, 281-4 Rio Verde Pl., Milpitas, Calif. 95131
Filed Nov. 22, 1978, Ser. No. 963,129
Int. Cl.[3] G09B *25/00*
U.S. Cl. 35—1 **9 Claims**



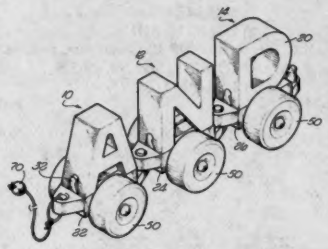
1. A device for aiding in the selection of a balanced diet comprising:
(a) a housing;
(b) an upright member disposed in said housing;
(c) a plurality of outwardly extending members projecting from said upright member; and
(d) an adjustably movable member mounted on each of said outwardly extending members for pivotal movement relative thereto,
(e) said housing having food indicia along an exposed wall thereof, and said adjustably movable members being movable in accordance with the consumption of food, the indicia on said housing relates to a plurality of food groups, there being an adjustably movable member for each food group.

4,222,180
VISUAL TEACHING DEVICE
Anthony E. English, 19312 S. Gunlock Ave., Carson, Calif. 90746
Filed Apr. 30, 1979, Ser. No. 34,574
Int. Cl.[3] G09B *27/00*
U.S. Cl. 35—43 **3 Claims**



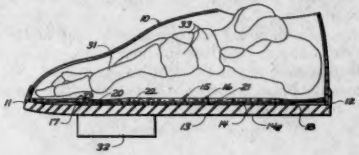
1. Apparatus for simmulating the visual perception of a black body comprising:
a cylindrical housing having an axially aligned bore extending partly from one end thereof, said bore including a first layer of black coating on the surfaces thereof and a second layer of black smoothing coating on said first layer and said one end including a coating of phosphorescent paint.

4,222,181
MOBILE EDUCATIONAL TOY
Darold B. Cummings, 808 McCarthy Ct., El Segundo, Calif. 90245
Filed Nov. 14, 1977, Ser. No. 851,343
Int. Cl.[3] A63H *19/15*; G09F *7/10*
U.S. Cl. 35—73 **11 Claims**



1. An educational toy comprising a plurality of toy units, each unit comprising a mobile carriage structure, a single graphic block, and a coupling means for linking to other toy units, said coupling means providing for a detachable and pivotal linking in longitudinal alignment to other toy units, said coupling means being attached to said carriage structure, each of said graphic blocks being shaped in the form of an alphabet letter, number, or other symbol, said carriage structure being securely connected to said graphic block such that said carriage structure can be lifted by grasp of said graphic block, said carriage structure having a wheel means and a base, said wheel means being connected to said base, said wheel means making said carriage structure mobile, said plurality of toy units being detachably coupled to each other such that symbolic relationships between said graphic blocks can be formed by selective arrangement of said toy units.

4,222,182
SHOE INSOLE
David G. Sears, 1308 - 11th Ave., Lewiston, Id. 83501
Filed Feb. 21, 1979, Ser. No. 13,153
Int. Cl.[2] A43B *13/41, 7/06, 5/14*
U.S. Cl. 36—44 **11 Claims**



1. In a shoe insole:
an elongated plate extending from a toe end to a heel end and having transverse hinge means positioned between its toe end and heel end for allowing plantar flexion of the plate in one direction about a transverse hinge axis and for limiting the angular amount of such flexion in the opposite direction;
said plate comprising:
a first member extending from the toe end of the plate to a back edge formed across the first member at a location

between said transverse hinge means and the heel end of the plate;

and a second member overlying the first member, said second member extending from the toe end to the heel end of the plate and being fixed relative to the first member at a location between the toe end of the plate and the hinge axis;

whereby the heel end of the second member is free to pivot apart from the back edge of the first member in one direction about the hinge axis, while its pivotal movement in the opposite direction is angularly limited by abutting engagement of the first member.

4,222,183

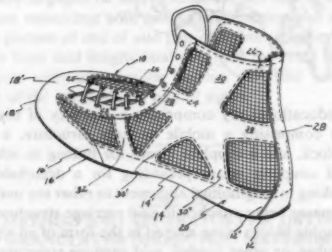
ATHLETIC SHOE

Billy J. Haddox, Rte. 2, Box 535 B, Chesterton, Ind. 46304

Filed Oct. 29, 1979, Ser. No. 89,538

Int. Cl.³ A43B *5/08, 23/00*

U.S. Cl. 36—114 **6 Claims**



1. A shoe comprising:

a strip of cover material circumscribing the edge of the heel, arch, sole and toe portions of the bottom component of the shoe;

a second strip of cover material spaced from said first mentioned strip forming an ankle perimeter component;

third and fourth strips of cover material connecting said first mentioned strip at the toe portion and to opposite ends of said second mentioned strip to form instep components;

a fifth strip of cover material vertically disposed connecting the back of the ankle perimeter component and said first mentioned strip at the heel portion;

reinforcing strips, one end thereof connecting the sides of said ankle perimeter component, the other ends thereof being bifurcated and the distal ends of said bifurcated ends connecting said first mentioned strip;

second reinforcing strips, one of the ends thereof connecting said instep components, and the other ends thereof connecting said first mentioned strip at the sole portion thereof;

a horizontally disposed reinforcing strip, one of the ends thereof connecting said instep components, and the other ends thereof connecting said fifth strip; and

a net material provided between said strips of cover material and said reinforcing strips.

4,222,184

SKI BOOT

Hermann Kastinger, A4863 Seewalchen, Austria

Filed Feb. 12, 1979, Ser. No. 11,657

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805943

Int. Cl.² A43B *5/04*

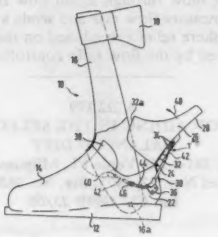
U.S. Cl. 36—121 **8 Claims**

1. A ski boot comprising:

a base shell having a bottom sole and a calf shell;

hinge means joining said calf shell at its lower end to said base shell adjacent to an ankle section of the base shell thus providing a hinged point therebetween, and a traction device for securing said base shell with said calf shell in clamped engagement with a leg calf of a wearer and being joined at an upper end to said calf shell above said hinge point,

said traction device having opposite ends connected to opposite sides of said base shell at shell areas opposing an instep of the foot,



said traction device further including guide means on opposite sides of said ankle section beneath said hinge means and cooperable with said traction device for applying clamping force through said calf shell to a leg calf of a wearer,

said calf shell being pivoted on said hinge means rearwardly away from the leg calf through an over center position relative to said hinge means to release the clamping force to enable the wearer to remove the ski boot from the foot.

4,222,185

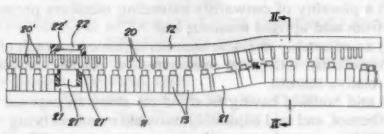
PLASTIC SHOE SOLE FOR SANDALS AND THE LIKE

Nello Giaccaglia, Via Matteotti 123, Castelfidardo, Italy

Filed Apr. 4, 1979, Ser. No. 27,067

Int. Cl.³ A43B *13/12, 13/16, 7/06, 3/12*

U.S. Cl. 36—30 R **7 Claims**



1. A shoe sole comprising an outsole member and an insole member of substantially identical outline, one of said members being provided along its periphery with a set of solid, substantially vertical studs having reduced tips surrounded by annular shoulders, the other of said members being provided along its periphery with a set of bores respectively aligned with said studs and penetrated by the tips thereof with said shoulders resting against said other of said members whereby said members are positively interconnected with formation of an air space therebetween, said insole member being provided inside a peripheral zone thereof with an array of venting apertures communicating with said air space and with a multiplicity of pins between said apertures extending toward said outsole member.

4,222,186

ADAPTABLE COMBINATION OF VEHICLE AND ATTACHMENTS

Lloyd A. Molby, Box 7788, Longview, Tex. 75602

Filed Jun. 26, 1978, Ser. No. 919,179

Int. Cl.² E02F *3/72*

U.S. Cl. 37—86 **16 Claims**

1. A combination of adaptable off-road vehicle and attach-

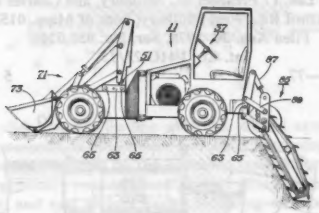
ments facilitating interchangeability of attachments for a multiplicity of purposes, comprising:

a. a frame carrying a prime mover and drive means and controls for controlling movement of said vehicle and power means for operating said attachments;

b. a plurality of at least three wheels carrying said frame;

c. means for steering said vehicle;

d. a first portion of attachment means carried by said frame and including a front pair of elongate substantially horizontal track means and a front pair of vertical track means; said track means being spaced laterally apart a first predetermined distance; said track means having a plurality of mounting stations each having a plurality of apertures; said apertures being laterally aligned for mounting of the attachments on respective mounting stations on one of the respective horizontal and vertical track means;



e. a plurality of attachments, each having respective second portions of attachment means connected with the respective attachments; each said second portion including a pair of track engaging means laterally spaced apart said first predetermined distance and being adapted to fittingly engage one of said pair of said track means; said second portion of attachment means having a plurality of apertures adapted to align with said apertures in said first portion of said attachment means on said vehicle; and

f. pin means for inserting through aligned said apertures in said first and second portions of said attachment means;

such that respective said attachments can be moved to a plurality of locations longitudinally of said frame of said vehicle and readily mounted and removed as desired.

4,222,187

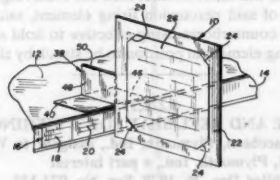
DISPLAY DEVICE

David N. Huck, R.D. 8, Box 262, Flemington, N.J. 08822

Filed Feb. 12, 1979, Ser. No. 11,381

Int. Cl.[2] G09F *3/10*

U.S. Cl. 40—16 **11 Claims**



1. A display device for use on supermarket shelves, comprising flat unitary sheet material, said sheet material being provided with a first cut extending inwardly from an edge thereon and a second cut extending inwardly from an opposite edge thereon, said first and second cuts being coaxial, leaving an uncut portion, and defining an elongated section partially severed from said material, said elongated section being divided into four parts by three score lines disposed generally perpendicular to the longitudinal axis of said elongated section, said elongated section being bent along two of said three score lines in one direction and bent in the opposite direction along the remaining score line; and adhesive means disposed along said elongated section, said adhesive means binding the part including said uncut portion to a cooperating part of said elongated section, leaving two remaining parts with adhesive thereon for affixing said material to said shelf.

4,222,188

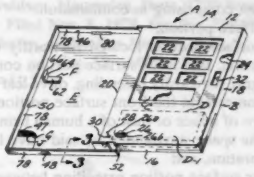
COMBINED MERCHANDISE DISPLAY, SOUND REPRODUCTION DEVICE AND INSIGNIA SUPPORTING UNIT

Fred A. Tarrant, 9661 Skylark Blvd., Garden Grove, Calif. 92641, and James S. Parsons, 12 Silverbit La., Rolling Hills Estates, Calif. 90274

Filed Sep. 22, 1978, Ser. No. 944,775

Int. Cl.[3] G09F *1/12*

U.S. Cl. 40—152.1 **10 Claims**



1. A combined sound reproduction, merchandise display and support for an insignia bearing sheet assembly, said assembly including:

a. a dimensionally stable resonator box that is formed from a resilient sheet material that has a back wall, front wall and a continuous side wall that extends therebetween, said front wall having at least one first recess extending downwardly therein toward said back wall, said front wall, backwall and side wall cooperating to define a confined space therebetween, and said recess capable of having said merchandise removably disposed therein;

b. a sound reproduction device situated within said confined space, and said resonator box serving to amplify the sound from said sound reproduction device when the latter is actuated;

c. first means for actuating said sound reproduction device from the exterior of said resonator box;

d. a flat cover that in a first position overlies said front wall, said cover having marginal edge portions that project outwardly from said cover, said cover when in said first position preventing said merchandise being displaced from said first recess;

e. hinge means that pivotally support said cover from said resonator box and allow said cover to be pivoted to a second position where access may be had to said merchandise in said first recess;

f. second means for removably locking said cover to said resonator box when said cover is in said first position;

g. a flat insignia bearing sheet that overlies said cover and is of substantially the same size and configuration as the latter and is supported in a flat position on said cover;

h. a hollow frame that overlies said insignia bearing sheet, said hollow frame defining an opening therein of such transverse cross-section that at least the major portion of said insignia is visible therethrough; and

i. third means for removably holding said hollow frame on said cover to grip said insignia bearing sheet between it and said cover, with said cover serving the functions of preventing inadvertent displacement of said merchandise from said recess when said cover is in said first position and as support for said insignia bearing sheet when the latter is removably held on said cover by said frame.

4,222,189

MEDALLION

Tomiro Kamei, No. 25, 3-Chome, Himegaike-Dori, Chigusa-ku, Nagoya City, Aichi Prefecture, Japan

Filed Sep. 7, 1978, Ser. No. 940,314
Int. Cl.[3] G09F *19/16*
U.S. Cl. 40—160 1 Claim

1. A medallion comprising in combination:

(a) a back surface portion,

(b) a front surface portion located forwardly of the back surface portion, said front surface portion comprising:

(1) an integral, forwardly extending, olive leaf wreath-like decoration around the front surface portion periphery.

(2) a pattern of a face or bust of a human being embossed within the space surrounded by said olive leaf wreath-like decoration, and

(3) a mirror surface portion extending between the olive wreath-like decoration and the face or bust of a human being,

(c) a bottom surface extending between the front and back surface portions and extending perpendicularly to the back surface portion, said bottom surface portion has a horizontal seat portion having a width of 30 to 40 percent of the maximum width of the front surface portion, and

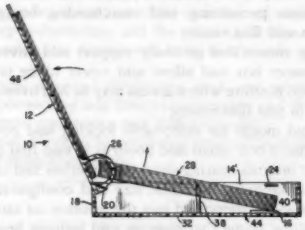
(d) the front surface portion is inclined toward the back surface portion, the maximum thickness being at the bottom surface portion.

4,222,190

DEVICE FOR HOLDING FLIP CARDS

Jack Solomon, Long Beach, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.

Continuation-in-part of Ser. No. 873,090, Jan. 27, 1978. This application Jul. 27, 1978, Ser. No. 928,392
Int. Cl.[3] G09F *19/00*
U.S. Cl. 40—530 14 Claims



1. In a device for holding flip cards each having a plurality of aligned apertures near one edge;

a cover hingedly mounted, at a first edge thereof, with respect to the remainder of said device, whereby said cover may be moved between a closed and a fully open position;

retaining means secured to said cover near said first edge and at a securement position spaced from said first edge along the length of said cover, said retaining means defining at least one protruding ring, each ring being adapted to extend through an aperture in each of said cards to permit the card to be turned in the manner of a page of a book; and

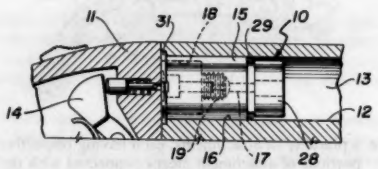
displacing means disposed near said first edge and actuated when said cover is moved toward said fully open position for withdrawing part of each card from said remainder of said device while permitting part of each card to remain in such remainder, at least a portion of said displacing means being spaced from said cover in the protruding direction of said retaining means, said protion engaging at least one of said cards and moving away from said remainder of said device as said cover is moved towards said fully open position.

4,222,191

CONVERSION PLUG

Thomas M. Lee, 17 Prospect St., Millbury, and Charles Kupfer, South Oxford Rd., West Millbury, both of Mass. 01527

Filed Aug. 30, 1978, Ser. No. 938,024
Int. Cl.[3] F41C *21/12*
U.S. Cl. 42—77 5 Claims



1. Conversion unit for use with a gun having a chamber leading to a bore and having a hammer, comprising:

(a) an elongated body having an external cylindrical surface adapted to fit smoothly into the chamber,

(b) a relatively-small passage extending axially through the body,

(c) a large counterbore formed in the end of the body adjacent the hammer,

(d) a threaded small counterbore entering the passage from the bottom of the large counterbore, and

(e) a nipple having a threaded end portion for threaded engagement with the small counterbore, the nipple having a passage entending axially through it, a main counterbore concentric with the passage and facing away from the threaded end portion to receive the main body portion of a percussion firing element having a main body portion at one end and a flange at the other end, said nipple having a shallow counterbore concentric with and of larger diameter than the main counterbore for receiving the flange portion of said percussion firing element, said main and shallow counterbores being effective to hold said percussion firing element in position to be struck by the hammer.

4,222,192

HANDLE AND REEL SEAT FOR A FISHING ROD

Hubert B. Jacobson, Plymouth, Ind., assignor to Williams R. Harris, III, Plymouth, Ind., a part interest

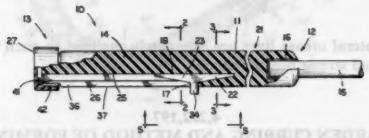
Filed Dec. 26, 1978, Ser. No. 973,136
Int. Cl.[3] A01K *87/06*
U.S. Cl. 43—22 6 Claims

1. An improved handle and reel seat for a fishing rod comprising:

(a) a single grippable body member including a forward end and a butt end thereon, said body member being elongated and having a continuous, generally rounded outer surface in axial cross section, the forward end including a rod-receiving means therein;

(b) an opening in the outer surface of said body portion connecting with a first cavity therein; and

(c) means for securely seating the reel feet on a T-shaped fishing reel support within said first cavity;
(d) a second elongated cavity in said body member extending from the butt end thereof and connecting with said first cavity;
(e) a removable slide member slidable within said second cavity; and
(f) a butt cap, said means for seating including means for securely attaching said butt cap to the butt end of said body member with said slide member retained therein and securely supporting the reel feet within said first cavity;
said first cavity having a converging space forward of said opening and adapted to seat the forward reel foot on the T-shaped reel support; and

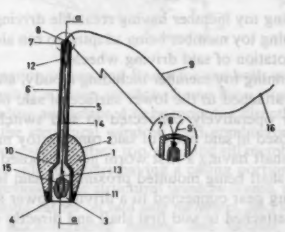


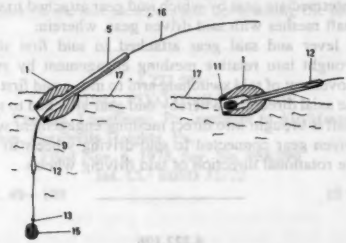
said slide member having a surface sloped upwardly and rearwardly on the forward end thereof and adapted to seat the rear reel foot on the T-shaped reel support;
said generally rounded outer surface being generally circular, and said second cavity including an elongated slot portion in the outer surface of said body member and extending from the butt end to said opening, said slide member including a corresponding outwardly projecting portion adapted to fit within the slot portion of said second cavity and further having an arcuate outer surface matching the curvature of the generally circular outer surface of said body member.

4,222,193
FISHING ROD CASE
Ronald A. Beck, 2331 W. 105th St., Bloomington, Minn. 55431
Filed Apr. 13, 1979, Ser. No. 29,888
Int. Cl.³ A01K *97/08*
U.S. Cl. 43—26 **6 Claims**

1. A flexible case for storing and protecting a fishing rod, comprising:
(a) an elongated, conformable, tubular sleeve member formed of braided plastic filaments of a generally open weave, said tubular sleeve member having one open end and one generally closed end;
(b) a loop member connected to said sleeve member proximate said closed end thereof; and
(c) a shrinkable tube member disposed proximate said closed end of said sleeve and surrounding the connection between said loop member and said sleeve member.

4,222,194
BOB FOR CAST FISHING
Sverre Thorvaldsen, Hageveien, Bede, 1700 Sarpsborg, Norway
Filed Nov. 8, 1978, Ser. No. 958,682
Claims priority, application Norway, Nov. 11, 1977, 773865
Int. Cl.³ A01K *97/04*
U.S. Cl. 43—41.2 **7 Claims**



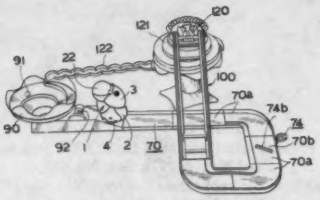


1. An improved cast fishing implement comprising a line, a sinker attached to the line, hook means attached to and spaced from the sinker, and an elongated buoyant bob having a hollow body at its forward end and a rod shaped extension extending rearwardly from said body, said body having a cavity which is open to receive said hook means and sinker and said extension having an interior longitudinal channel communicating with said cavity, said channel having a transverse dimension large enough to receive said sinker and the outer end of said extension having an opening therethrough communicating with said channel, said line passing through said opening and said opening having a size preventing passage of said sinker, said bob by itself having a center of gravity located sufficiently near the forward end of said bob that said bob will float in an upright position when said bob is free of said hook means and said sinker, and the collective center of gravity of said bob when said sinker is located in said channel near the outer end thereof being located such that said bob will float in a position more nearly horizontal than said upright position.

4,222,195
COMBINATION OF RUNNING TOY AND TRACK ALONG WHICH TOY RUNS

Kenzo Kurosawa, and Fukuji Hachimura, both of Tokyo, Japan, assignors to Gakken Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,864
Claims priority, application Japan, Aug. 25, 1978, 53/116380[U]; Aug. 28, 1978, 53/117667[U]; Oct. 11, 1978, 53/139389[U]; Nov. 20, 1978, 53/159873[U]
Int. Cl.³ A63H *11/10*
U.S. Cl. 46—202 9 Claims



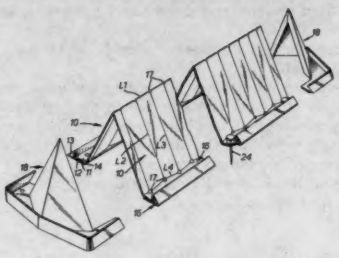
1. A toy comprising:
a track;
a running toy member having rotatable driving wheels, said running toy member being adapted to run along said track by rotation of said driving wheels;
said running toy member including a body, and a switching arm attached to the lower surface of said body;
a lever operatively connected to said switching arm and disposed in said body of said running toy member;
a first shaft having a first worm gear disposed thereon, said first shaft being mounted proximal to said lever;
a driving gear connected to a driving power source;
a gear attached to said first shaft and directly meshing with said driving gear;
a driven gear connected to said driving wheels; and
an intermediate gear by which said gear attached to said first shaft meshes with said driven gear, wherein:
said lever and said gear attached to said first shaft are brought into relative meshing engagement by swinging movement of said switching arm to move said first shaft in the axial direction, whereby said gear attached to said first shaft is brought into direct meshing engagement with said driven gear connected to said driving wheels to reverse the rotational direction of said driving wheels.

4,222,196
GARDEN CLOCHE BLANK

Peter C. Pointon, Camberley, England, assignor to Wilkinson Sword Limited, Buckinghamshire, England

Filed Oct. 12, 1978, Ser. No. 950,662
Claims priority, application United Kingdom, Oct. 18, 1977, 43258/77
Int. Cl.³ A01G *13/04*
U.S. Cl. 47—27 10 Claims

1. A garden cloche blank comprising
a flexible elongate sheet of light-transmitting material, the sheet having
a central crease line extending longitudinally of the sheet,
a complementary pair of parallel spaced zig-zagging crease lines extending longitudinally of the sheet and each defining a plurality of crests and troughs and
lateral crease lines extending toward the central crease line of the sheet from the crests and troughs of said zig-zagging lines,
the arrangement of the lines being such that upon bending the sheet about the crease lines to form the upstanding sides of a cloche therebetween and to form flanges outwardly thereof, the portions of the sheet between the

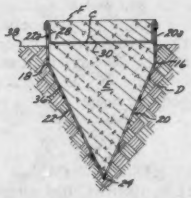


lateral crease lines are alternately inclined to each other and strengthen the cloche.

4,222,197
GARDEN CURBING AND METHOD OF FORMING SAME

George W. S. Johnson, 2926 Club House Rd., Costa Mesa, Calif. 92626

Filed Oct. 2, 1978, Ser. No. 947,469
Int. Cl.³ A01G *1/00;* E04B *1/16;* E01C *11/22*
U.S. Cl. 47—33 8 Claims



1. A dimensionally stable assembly that may be disposed in a trench dug into the ground, said assembly serving as a form to receive fluid concrete and maintain said fluid concrete in a border defining configuration during the time said concrete sets, with said border being of a sufficient depth that roots of grass on one side of said border will grow thereunder to the opposite side of said border, said assembly including:
a. a generally rectangular sheet of a substantially rigid material that includes first and second longitudinally extending, angularly disposed side walls that intersect at their lower portions to define an apex, and first and second substantially parallel side wall extensions that extend upwardly from said first and second side walls; and
b. first rigid means that extend transversely between said first and second side wall extensions and are removably secured thereto in longitudinally spaced relationship to maintain said first and second side wall extensions in fixed transverse relationship during the period said fluid concrete is being poured into said assembly as well as during the period in which said fluid concrete is setting is said assembly.

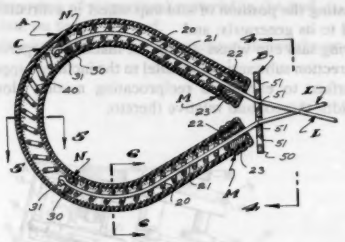
4,222,198
TREE TIE

Alex Napolitano, and Dennis M. Napolitano, both of 8034 Milliken Ave., Whittier, Calif. 90602

Filed Jun. 9, 1978, Ser. No. 914,055
Int. Cl.³ A01G *17/10*
U.S. Cl. 47—43 5 Claims

1. A tree tie comprising a fixed support structure in lateral spaced relationship with a tree trunk, an elongate tubular flexible collar yieldingly engaged about said trunk with its

opposite end portions extending and converging laterally from the trunk toward said support structure; a pair of elongate flexible tie lines having inner end portions extending into related end portions of the collar and having outer end portions extending from the collar to said support structure; anchoring means securing the outer end portions of the lines to the support structure; elongate helical compression springs with inner



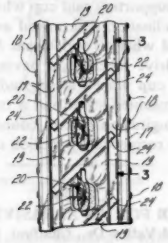
and outer ends and positioned within the end portions of the collar; spring stops fixed at the ends of the collars and engaging the outer ends of the springs related thereto; and coupling means at the inner ends of the tie lines coupling the inner ends of the lines with the inner ends of their related springs, said springs normally yieldingly urging the inner ends of the lines longitudinally inwardly in their related ends of the collar and the opposite ends of the collar toward said support structure.

4,222,199

HYDROPONICS GROWING CONDUIT

Donald K. Kehl, Panama City, Fla., assignor to Eugene A. Crist, Panama City, Fla.

Filed Jul. 10, 1978, Ser. No. 923,051
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **5 Claims**



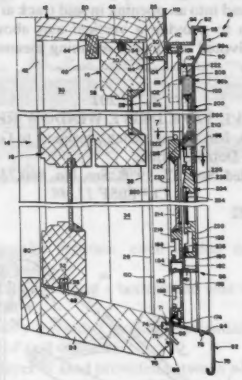
1. In combination, a rigid trough formed of a bottom and fixed raised sides attached to said bottom, said raised sides having substantially uniform height for the length of said trough, and a conduit placed lengthwise in said trough, said trough being substantially coextensive with said conduit, said conduit comprising a continuous plant tube constituted of a thin, pliant plastic foil for containing plant root systems therein to receive a water-nutrient solution carried in said conduit, means selectively operable to partially dam the flow of said solution or to form a bridge over said conduit to support vegetation, said means consisting of an elongated member longer than the width of said trough and being of such height as to form a partial dam to partially dam the flow of said solution when placed on the bottom of and across said trough at an angle other than perpendicular to said raised sides, said elongated member alternatively serving as a bridge when placed across the tops of said sides and substantially perpendicular to said sides.

4,222,200

COMBINATION WINDOW CASING AND STORM WINDOW FRAME

James R. Beirnes, P.O. Box 830, Joliet, Ill. 60434

Filed Feb. 5, 1979, Ser. No. 9,759
Int. Cl.[2] E05B *3/26*
U.S. Cl. 49—63 **18 Claims**



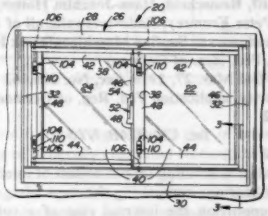
1. A combination casing and frame for use both as the window casing and as a storm window frame for a double-hung structural window and adapted to be mounted directly against the frame of the structural window, said combination casing and frame comprising: unitary top, side, and sill members, each of said top and side members having a casing portion adapted to overlie a portion of the structural window frame, means for slidably mounting sashes on said side members, said side members having latch-engaging means, and latches movably mounted on opposite sides of said sill member in retractable engagement with said latch-engaging means for mounting the sill member on the side members and demounting the sill member.

4,222,201

SLIDING, PIVOTING WINDOW

Silvio F. Yanessa, Langhorne, Pa., assignor to Air Master Corporation, Cornwells Heights, Pa.

Filed Nov. 6, 1978, Ser. No. 958,290
Int. Cl.[2] E05D *15/22*
U.S. Cl. 49—189 **15 Claims**



1. A panel adapted to slide horizontally along a first track and to pivot about a vertical axis located at a predertimined location in said track, said panel comprising a sash including a stile and a bottom rail, carrier means connected to said bottom rail and disposed within said track to enable said sash to slide therealong, releasable retaining means holding said sash within said track and pivot means mounted on said sash, said carrier means comprising a roller assembly having a body portion, a roller mounted within said body portion and adapted to rotate

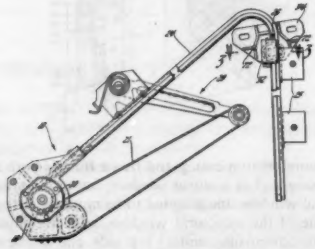
about a horizontal axis to roll along said track and a rotatable insert mounted on said body portion and rotatable about a vertical axis, said insert including a passageway, said pivot means comprising at least a first reciprocable member having a free end extending vertically, said member being mounted on said sash and arranged to be moved vertically from a retracted position to an extended position wherein said free end extends out of said sash, through said passageway in the insert of said carrier means and into an opening in said track at said predetermined location to provide a vertical axis about which said panel can be pivoted when said retaining means is released.

4,222,202

AUTOMOTIVE TAPE DRIVE WINDOW REGULATOR

Dale W. Pigeon, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1978, Ser. No. 960,737
Int. Cl.[2] E05F *11/48*
U.S. Cl. 49—352 **4 Claims**



1. In a tape drive window regulator mechanism having a perforated tape slidably mounted in a fixed channel track for opening and closing a window, the improvement comprising a drive block and guide block and sash plate for cooperatively connecting the tape and window, said drive block having one or more projections for engaging the perforated tape, said guide block having channel means for slidably mounting the guide block on the outside of the channel track, said guide block and said drive block having interlocking means for fixedly interlocking same while also retaining the drive block in engagement with the tape, said sash plate having means by which it is fixed to the window, and said guide block and said sash plate having interlocking means for interconnecting same.

4,222,203

MACHINING DEVICE AND METHOD

Friedrich Wolff, Remscheid; Hans-Joachim Hölter, Wuppertal, and Hans-Peter Krumrey, Radevormwald, all of Fed. Rep. of Germany, assignors to Supfina Maschinenfabrik Hentzen KG, Remscheid, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,162
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714222
Int. Cl.[2] B24B *7/16*
U.S. Cl. 51—3 **12 Claims**

1. A method of machining tappet collars of internal rings of tapered roller bearings comprising the steps of:

rotatably supporting the internal ring of a roller bearing provided with a tappet collar having a surface to be machined;

providing a frusto-conical cup wheel having an abrading surface narrower than said tappet collar surface;

disposing said cup wheel with its axis of rotation inclined at an angle to the axis of rotation of said inner ring;

positioning said cup wheel with its axis having an angle of inclination determined in accordance with the equation:

$$\beta=\delta+\arcsin(\tfrac{1}{2}D_a-h)/R$$

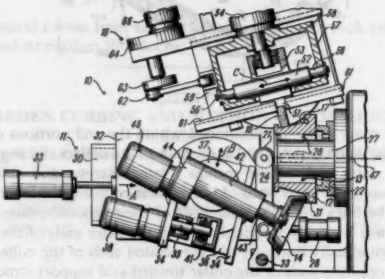
where R is the radius of the radial generating line of the surface to be machined and is given by:

$$R=\tfrac{1}{2}(D_a-h)/\sin\alpha$$

and where δ is determined by the dimensions of the cup wheel;

adjusting the position of said cup wheel in a direction parallel to its generatrix; and

moving said cup wheel during the machining operation in a direction substantially parallel to the inclined tappet collar surface to execute a reciprocating motion along with width thereof and relative thereto.



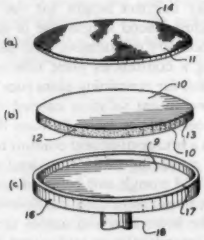
4. A device for machining tappet collars of internal rings of tapered roller bearings comprising, in combination, means for rotatably supporting the internal ring of a tapered roller bearing provided with a tappet collar having a surface to be machined, a frusto-conical cup wheel having an abrading surface narrower than said tappet collar surface, means for rotatably supporting said cup wheel with its axis of rotation inclined at an angle to the axis of rotation of said internal ring supporting means, means for supporting said cup wheel with its axis having an angle of inclination determined and further including machine stand, and wherein said means for moving said cup wheel include a drive mechanism having a driving spindle connected to said cup wheel, a longitudinal slider rotatably mounted on said machine stand and a transverse slider supported on said longitudinal slider connected to said drive mechanism for the reciprocating motion of said cup wheel.

4,222,204

HOLDER FOR AN ABRASIVE PLATE

Robert L. Benner, 4 Valley Dr., Chalfont, Pa. 18914

Filed Jun. 18, 1979, Ser. No. 49,730
Int. Cl.[3] B24D *9/08*
U.S. Cl. 51—362 **2 Claims**



1. A holder for an abrasive plate comprising,

(a) a shaft for rotating a holder,

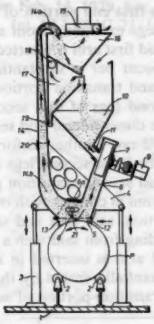
(b) an enlargement on the shaft defining a holder for an abrasive plate,
(c) a peripheral flange on the enlargement defining a concavity on the enlargement,
(d) a concavity on the enlargement defining a seat,
(e) a pad positioned in the concavity,
(f) the pad composed of high friction, plastic, flexible, shock absorbing material,
(g) a dispersion of magnetized material in the pad,
(h) a plate on top of the pad,
(i) an abrasive dress on the plate secured thereto by an adhesive.

4,222,205

BLAST CLEANING MACHINE FOR PIPES AND OTHER CYLINDRICAL OBJECTS

Charles W. Lake, Tuttle, and Herb Weber, Yukon, both of Okla., assignors to Worldwide Blast Cleaning Limited, Nassau, The Bahamas

Filed Aug. 10, 1978, Ser. No. 932,811
Claims priority, application United Kingdom, Aug. 15, 1977, 34162/77
Int. Cl.³ B24C *3/32*
U.S. Cl. 51—420 **7 Claims**



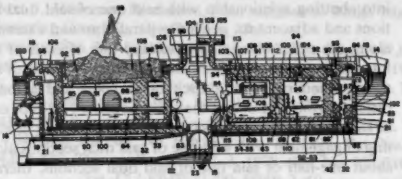
1. A machine for blast cleaning a cylindrical workpiece comprising
means for supporting the workpiece horizontally in such a manner that it can be rotated about its axis,
an enclosure disposed above the support means and having on its lower side an opening arranged to confront the upper side of the workpiece located on the support means,
A centrifugal blast wheel adapted to receive abrasive from a storage hopper and to project a stream of the abrasive in a downwardly inclined direction on to the area of the workpiece exposed through the said opening, and
a conduit by which abrasive rebounding from the workpiece surface is returned to abrasive reclaim means,
wherein the enclosure includes a duct through which abrasive is projected by the blast wheel and the said conduit includes a lower hinged portion, which assists to define the said opening and which is displaceable relative to a fixed portion of the said conduit to vary the size of the said opening, means being provided for securing the lower hinged portion in an adjusted position.

4,222,206

EARTHQUAKE RESISTANT, EVEN LOADED MAN-MADE LAND STRUCTURE AND METHOD OF MAKING SAME

Akinori Kitamura, 259, Kajigaya Tozuka-ku, Yokohama, Kanagawa-ken, Japan

Filed Jan. 5, 1979, Ser. No. 1,306
Int. Cl.² E02D *27/34*; E04H *9/02*
U.S. Cl. 52—167 **5 Claims**



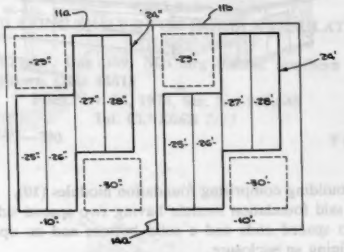
1. An earthquake resistant, even loaded man-made land structure comprising:
an open container having a bottom and side walls provided in the earth;
a plate slidably provided in and substantially closing the open end of said container;
at least one layer of sand provided between a bottom surface of said plate and said bottom of said container;
a means for introducing hydraulic fluid into said sand and for maintaining said hydraulic fluid under pressure; and
dirt provided on top of said plate in said container.

4,222,207

APPARATUS AND METHCD FOR ERECTING A MOBILE HOME ON A PREEXISTING LOT

Robert C. Latimer, Irvine, and Gary W. Pomeroy, Corona Del Mar, both of Calif., assignors to Golden West Homes, Santa Ana, Calif.

Filed Aug. 28, 1978, Ser. No. 937,434
Int. Cl.² E02D *27/00*
U.S. Cl. 52—169.3 **10 Claims**



1. A method for erecting at least a pair of mobile homes on at least a pair of generally elongated rectangular adjacent lots, each of said lots circumscribed by a pair of spaced substantially parallel elongated boundary lines interconnected by a pair of short spaced substantially parallel boundary lines, said method comprising the steps of:
transporting at least four elongated rectangular mobile home sections of substantially the same size and configuration to each said lot;
aligning two of said sections in side-by-side relationship on each of said lots thereby forming a first elongated rectangular dual section on each of said lots;
aligning the other two of said sections in side-by-side relationship to the first two of said sections on each of said lots

thereby forming a second elongated rectangular dual section on each of said lots;

erecting one of said dual sections on each of said lots adjacent to, generally parallel to and extending along an elongated boundary line of each of said lots and spaced both a short distance from one of the short boundary lines of each of said lots and a longer distance from the other of the short boundary lines of said each of said lots; and

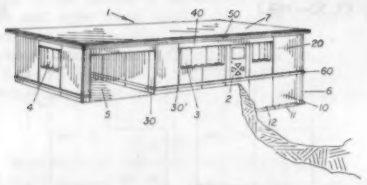
erecting the other of said dual sections on each of said lots into abutting relationship with said one of said dual sections and adjacent to, generally parallel to and extending along the other elongated boundary line of each of said lots and spaced a short distance from the other of said short boundary lines of each of said lots and a longer distance from said one of the short boundary lines of each of said lots, said other of said dual sections being in abutting engagement with said one of said dual sections along about one-half of said one of said dual sections, thereby forming a pair of generally square-shaped areal spaces disposed only at opposite diagonal ends of each of said lots, one said space being at the front of each of said lots adjacent to and accessible from an adjacent roadway to permit side-by-side parking of two cars, and the other said space being at the rear of each of said lots and separated from the roadway by two said sections, the pair of dual sections on one of said lots being oriented on said one of said lots substantially the same as the pair of dual sections on the other of said lots so that the pair of areal spaces on one of said lots are separated from the pair of areal spaces of the other of said lots by said sections thereby providing privacy between the areal spaces on one of said lots from the areal spaces on the other of said lots.

4,222,208

MODULAR HOMES

George W. Ferver, 2490 Penn. Ave., Ext. R.D., Warren, Pa. 16365

Filed Oct. 7, 1977, Ser. No. 840,137
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.5 6 Claims



1. A building comprising foundation modules (10),

each said foundation module having two spaced sides and two spaced ends and a solid bottom and an open top defining an enclosure,

said bottom extending outwardly at each side from said side walls,

forming two solid outwardly directed flanges having a top surface integrally connected to said bottom forming a continuation of said bottom,

said flanges, sides, ends and bottoms being integrally cast from concrete,

said bottom and flanges having substantially a flat lower surface adapted to rest on a pre-leveled gravel base,

said enclosure is adapted to contain a low heat conductive insulation material,

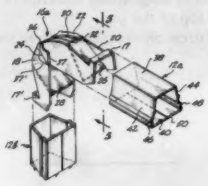
said top surface of said bottom being disposed in a plane substantially parallel with the top surface of said flanges and means supporting wall members of said building on said top surface of said foundation forming said building.

4,222,209

CORNERPIECE FOR USE IN MULTIPLE PANE WINDOW

Wallace H. Peterson, Burnaby, Canada, assignor to Peterson Metal Products, Ltd., Coquitlam, Canada

Filed Feb. 27, 1978, Ser. No. 881,900
Int. Cl.[2] E16B *7/00*; E06B *7/12*
U.S. Cl. 52—172 16 Claims



1. A cornerpiece for joining adjacent tubular spacer bars in a spacer frame, said bars containing a granular desiccant, said cornerpiece comprising:

a channel member having a web;

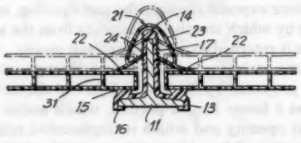
first and second legs extending substantially orthogonally from said web in substantially parallel spaced relation, said channel member being bent to form first and second elongate arms, each of said first and second arms being insertable into an associated one of said spacer bars, said first and second legs of said first arm extending along the elongate dimension of said first arm and then converging toward one another to form a first transition portion, the legs then extending from said first transition portion in parallel relation to one another and in contact with one another to form a first end portion of said first arm, said first and second legs extending from said web a distance such that when said first arm is inserted into its associated spacer bar the spacer bar is substantially sealed by said first end portion and transition portion of said first arm, said first and second legs of said second arm extending along the elongate dimension of said second arm and then converging toward one another to form a second transition portion, said first and second legs of said second arm extending from said second transition portion in substantially parallel relation in contact with one another to form a second end portion, said first and second legs of said second arm extending from said web a distance such that when said second arm is inserted in its spacer bar, the spacer bar is substantially sealed by the second end portion and second transition portion of said second arm.

4,222,210

CONVERSION MUNTINS FOR GLAZING FRAMES

Friedrich Hanstein, Gross-Zimmern, and Theodor P. Moench, Gross-Umstadt-Heubach, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 8, 1979, Ser. No. 10,537
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808155; May 10, 1978, 2820306
Int. Cl.[2] E04C *1/34*
U.S. Cl. 52—461 13 Claims



1. A conversion muntin for use on a T-shaped glazing muntin to adapt the latter to support a light-transmitting panel, said

T-shaped glazing muntin having a stem and a cross-piece defining a pair of bearing surfaces for said panels, said conversion muntin comprising a muntin cover element having a generally T-shaped configuration including a recessed stem and a pair of oppositely extending bearing arms, said recessed stem being adapted to receive the stem of the glazing muntin with said bearing arm overlying the bearing surfaces of the glazing muntin, said bearing arms each having continuous panel support elements formed on the sides thereof opposite said bearing surfaces of the glazing muntin and having free ends including means for clamping the cover element to the edges of the cross-piece of the glazing muntin, said clamping means being spaced from one another to define an opening therebetween providing access to said recessed stem to allow insertion of the glazing muntin into the cover element, said recessed stem of the muntin cover element having a plurality of longitudinally-extending grooves formed therein on both sides thereof; and a clamping strip adapted to be mounted on said recessed stem to hold a light-transmitting panel against said panel support elements, said clamping strip comprising a pair of elongated parallely-extending rails and a hood integrally formed therewith to receive a portion of said recessed stem, said rails having oppositely-facing slightly-spaced longitudinally-extending lips and being joined to said hood to form an obtuse angle therebetween opening towards said muntin cover element to receive therebetween said recessed stem and allow said lips to be engaged in said grooves.

4,222,211

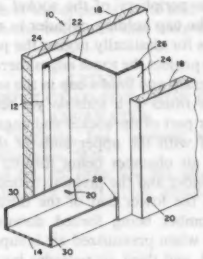
STRADDLING STACKABLE STUD

Robert J. Pearson, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Continuation-in-part of Ser. No. 870,368, Jan. 18, 1978. This application Feb. 14, 1979, Ser. No. 12,209

Int. Cl.³ E04G *21/14*

U.S. Cl. 52—741 **3 Claims**



1. The method of erecting a wall comprising the steps of mounting a formed sheet metal stud vertically with respective ends mounted on a floor runner and a ceiling runner, said stud having an elongate flat central web and two elongate flat flanges, said two flanges extending from the two elongate edges of said web, said two flanges extending in opposite directions from said web and forming an angle of from about 85° to 95° with said web, said flanges having a short extent at each end which is separated from said web by a short slot extending inward from the end of the stud at each junction of the web and a flange at each end of the stud, with said flanges being free to straddle said floor and ceiling runners, disposing floor and ceiling runners each having a pair of vertical flanges extending toward said stud and with said flanges of each said runner extending toward the other runner disposing said stud flange bottom ends against respective outer sides of opposed vertical flanges on said floor runner and disposing said stud flange top ends against respective outer sides of opposed vertical flanges on said ceiling runner by disposing runner flanges within said slots, disposing wallboard against the outer face of one of said stud flanges, and forcing a metal fastening means through said wallboard and said stud flange while said stud flange remains held firmly against the wallboard inner face, said stud flange being held firmly against said wallboard inner face solely by the stud flange ends being disposed against the outer faces of runner flanges.

4,222,212

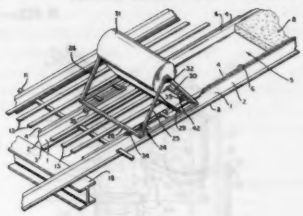
INSULATED ROOF

Robert J. Alderman, Bradenton, Fla., assignor to Butler Manufacturing Company, Grand View, Mo.

Division of Ser. No. 832,656, Sep. 12, 1977, Pat. No. 4,147,003, which is a continuation-in-part of Ser. No. 638,329, Dec. 8, 1975, Pat. No. 4,047,345, which is a continuation-in-part of Ser. No. 494,097, Aug. 2, 1974, Pat. No. 3,969,863, and a continuation-in-part of Ser. No. 656,642, Feb. 9, 1976, Pat. No. 4,047,346, and Ser. No. 649,911, Jan. 16, 1976, Pat. No. 4,075,807. This application Jul. 3, 1978, Ser. No. 921,510

Int. Cl.³ E04F *21/00*; E04B *2/60*

U.S. Cl. 52—749 **5 Claims**



1. Apparatus for installing insulation material in the roof of an industrial building and the like comprising a framework for supporting a reel of sheet material, guide means for guiding said framework along a pair of adjacent parallel purlins in the roof structure, and means extending below said guide means for protruding downwardly between the adjacent parallel purlins and urging the sheet material downwardly between the adjacent ones of the purlins.

4,222,213

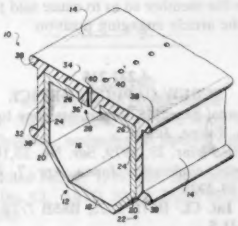
INSULATING SPACER FOR DOUBLE INSULATED GLASS

Gerald Kessler, Box 389, McClurg Rd. at Southern Blvd., Youngstown, Ohio 44512

Filed Nov. 14, 1978, Ser. No. 960,648

Int. Cl.² E06B *7/12*

U.S. Cl. 52—790 **9 Claims**



1. An insulating spacer for precision separation of plates in double insulated glass, comprising:

a metal spacer for interposition between two glass panes, said metal spacer permitting conventional sealant bonding of the glass to the spacer, said metal spacer having a slot running the length thereof; and

insulating means attached to said metal spacer to thermally isolate said metal spacer from the two panes of glass,

thereby greatly reducing the heat transfer from one pane of glass to the other through the spacer, said insulating means comprising an elongated plastic element formed of unitary, generally U-shaped section fitting tightly to a portion of said metal spacer and fixedly attached thereto by friction, said insulating means covering at least a portion of the two sides of the spacer which contact the glass plates, said insulator having a series of small diameter holes extending therethrough and aligned with the slot running the length of said metal spacer, the legs of said U-shaped element being biased toward one another, said frictional engagement being provided by the body of said metal spacer forcing said legs apart.

4,222,214

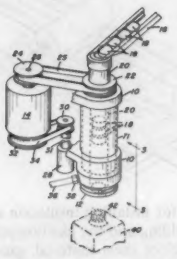
CHUCKING APPARATUS

Peter G. Schultz, Fairport, and Robert H. Shea, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1978, Ser. No. 915,106

Int. Cl.[3] **B65B** *7/28;* **B67B** *1/06*

U.S. Cl. 53—309 **4 Claims**



1. Chucking apparatus for engaging an article, comprising:

a plurality of elongated jaw members disposed peripherally about a cap engaging location and lying in a horizontal plane, each jaw member pivotable about a respective vertical axis displaced toward one end of the jaw member to an article engaging position, said respective axes being mutually parallel;

a deformable resilient member arranged to press against opposed end portions of said elongated jaw members in response to deformation of said resilient member to produce unequal torques about said respective axes of said jaw members, thereby causing said jaw members to pivot; and

means for exerting fluid pressure upon said resilient member to deform the member so as to cause said jaw members to pivot to the article engaging position.

4,222,215

SCREW-CAPPING DEVICE

Motoharu Takano, Machida, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,185

Claims priority, application Japan, Apr. 7, 1978, 53-40285; Jan. 19, 1979, 54-3925

Int. Cl.[2] **B67B** *3/20;* **B65B** *7/28*

U.S. Cl. 53—331.5 **5 Claims**

1. A screw-capping device comprising:

a vertical, hollow rotating shaft driven by a suitable driving device;

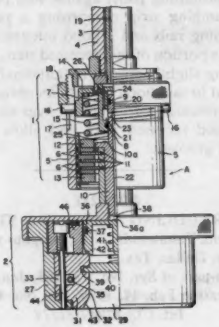
a support stem inserted axially through the rotating shaft and having an axial, first air passage for supplying pressurized air;

a hollow coupling secured to the lower end of the support stem and having a second air passage communicating with the first air passage at the lower end thereof, the air flow path from the first air passage through the second air passage being formed with bends;

a vertical central shaft slidably fitted at the upper end thereof in the hollow interior of the coupling and having an axial, third air passage communicating at the upper end thereof with the second air passage, sealing means being provided to seal the sliding fit between the central shaft and the coupling against leakage of air therethrough;

a clutch mechanism having driving and driven friction plates and interposed between the rotating shaft and the central shaft to transmit power therebetween at torques below a specific maximum torque, the clutch mechanism being enclosed within a clutch housing fixed to the rotating shaft; and

a cap chuck head comprising a cap holding cylinder fixed at the upper part thereof, in a state separated from the clutch housing, to the lower end of the central shaft and having



a cap-receiving socket open at the bottom thereof, a plurality of cap holding pawls respectively having tooth edges at the periphery of the socket and pivotally supported by the cap holding cylinder in a circular arrangement, means for elastically urging the pawls to rotate in a direction to project the tooth edges thereof into the socket thereby to grasp and hold a cap in the socket, and a pressing member fitted in a slidable yet sealed manner in a deeply inner part of the socket and engaging at the lower part thereof with the upper ends of the tooth edges, a pressurized air chamber being formed between the cap holding cylinder and the pressing member and communicating with the lower end of the third air passage, the pressing member being forced downward against the tooth edges when pressurized air is supplied through the first, second, and third air passages into the air chamber thereby to spread open the tooth edges and release the cap which has been held thereby.

4,222,216

OPENING OF ENVELOPE WITH DARKENED EDGES

Martin T. Abrams, Chicago, Ill., assignor to AES Technology Systems, Inc., Elk Grove Village, Ill.

Filed Feb. 5, 1979, Ser. No. 9,246

Int. Cl.[2] **B65B** *43/26, 69/00*

U.S. Cl. 53—492 **14 Claims**

1. In the method of opening envelopes made of cellulosic paper in which at least one chemical degradation agent is applied to at least one edge of each envelope followed by the application of heat and mild mechanical action thereto and said heat is generated from a radiant source, the improvement wherein said radiant source is maintained at a temperature which generates a substantial amount of radiation at a wave length not higher than about 2 microns and wherein there is applied to at least said one edge a darkening material capable, when applied to white paper, of absorbing at least

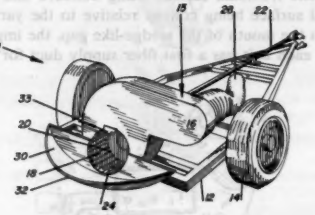
80% of incident radiation from a radiation source at 2500° K.

4,222,217

AQUATIC WEED HARVESTING APPARATUS

Marshall B. Brown, P.O. Box 9515, Winter Haven, Fla. 33880

Filed Apr. 3, 1978, Ser. No. 892,503
Int. Cl.[2] A01D *44/00*
U.S. Cl. 56—9 **22 Claims**



1. Apparatus for harvesting aquatic plants from a body of water comprising:

transporting means adapted to move into said body of water;

a centrifugal pump including a housing mounted on one end of said transporting means and adapted to be at least partially submerged in said body of water, said housing having an opening for transmitting water and aquatic plants therein into said housing, said pump comprising means for pumping water and aquatic plants from said body of water and through said opening; and

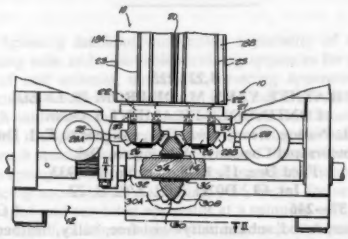
a skimmer tray surrounding the lower, submerged portion of said opening and extending upward and outward from said housing to an outer rim, said skimmer tray forming an envelope for restricting water flow into said opening, such that said pump may be employed to move water and aquatic weeds at the upper layer of said water to prevent disturbance to the bottom of said body of water.

4,222,218

FLOATING DRIVE GEAR FOR CROP HARVESTING APPARATUS

Richard G. Moe, LaPorte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 25, 1979, Ser. No. 60,508
Int. Cl.[3] A01D *45/02, 69/06*
U.S. Cl. 56—104 **1 Claim**



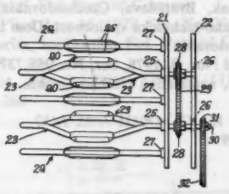
1. A single row corn harvesting unit adapted to be mounted at the forward end of a harvesting combine and comprising a gear subassembly, a pair of snapping rolls extending forwardly from said gear subassembly in contiguous relation to each other, said snapping rolls cooperating with each other in the corn harvesting operation, each of said snapping rolls having a driven bevel gear mounted on the rearward end thereof, means for rotatably driving said snapping rolls comprising a drive shaft, a double bevel gear mounted on said drive shaft, said double bevel gear having opposed gear faces each respectively adapted to drivingly engage the corresponding driven bevel gear on one of said respective snapping rolls, said double bevel gear having a spline on the inner periphery thereof, the portion of the axial length of said drive shaft which receives said double bevel gear having a spline on the outer periphery thereof which is adapted to receive and mate with said spline on the inner periphery of said double bevel gear, whereby said double bevel gear is freely slidable along the spline on said drive shaft to permit said double bevel gear to automatically center itself with respect to said driven bevel gears on said snapping rolls.

4,222,219

SPINDLE CONSTRUCTION FOR CITRUS FRUIT PICKER

Fred D. Lasswell, 1111 N. Westshore Blvd., Tampa, Fla. 33607

Filed Feb. 12, 1979, Ser. No. 11,225
Int. Cl.[3] A01D *46/20*
U.S. Cl. 56—328 R **5 Claims**



1. A spindle construction for a fruit harvester comprising spaced apart inner and outer end sections in alignment on an axis of rotation, a first intermediate section joined with said inner end section at an angle out of the axis of rotation, a second intermediate section joined with said outer end section at an angle out of the axis of rotation and in a direction different from said first intermediate section and lying in a plane different from the plane of the first intermediate section, and a third intermediate section adjoining the first and second intermediate sections and disposed at a compound angle relative to and spaced outwardly from the axis of rotation, and said third intermediate section further disposed at an angular disposition different from either of the first and second intermediate sections, and the third of said intermediate sections disposed at a compound angle having means thereon for effecting fruit harvesting.

4,222,220

KNOTTER MECHANISM

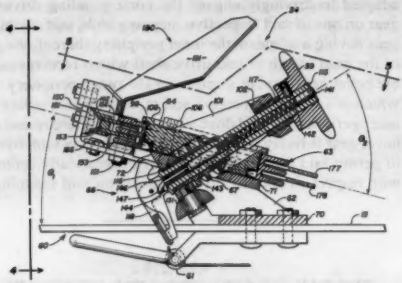
Edwin B. Nolt, New Holland, Pa., and Marc G. Vansteelant, Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Feb. 8, 1979, Ser. No. 10,205
Int. Cl.[3] A01D *59/04;* B65B *13/26*
U.S. Cl. 56—343 **14 Claims**

10. In a knotter for a crop baling machine including a support frame, a washer-like twine disc with an axial opening, a hub extending through said axial opening in said twine disc fixed to said frame and rotatably holding said twine disc relative thereto, a billhook including an elongate shaft, said shaft extending angularly through said hub, and means to rotate said shaft and said twine disc in timed relation, the improvement wherein:

said means for rotating comprises a worm gear axially fixed

to said shaft, and a plurality of gear teeth fixed to the inner periphery of said axial opening cooperatively engaging



said worm gear whereby rotation of said shaft produces a corresponding rotation of said twine disc.

4,222,221

WINDING MACHINE WITH MULTITWIST SPINDLE

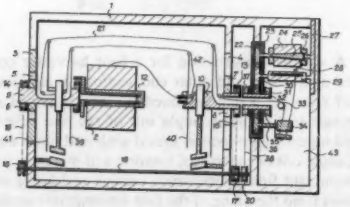
Ferdinand Lenorak, Bratislava, Czechoslovakia, assignor to Slovenska vedecko-technicka spolocnost, Dom techniky, Bratislava, Czechoslovakia

Filed Nov. 8, 1978, Ser. No. 958,737

Claims priority, application Czechoslovakia, Nov. 12, 1977, 7421/77

Int. Cl.³ D01H *7/86, 1/10*

U.S. Cl. 57—58.49 **7 Claims**



1. A winding machine with multitwist spindle for the working textile fibers and yarns which comprises:

a supporting frame for independently rotatably supporting and multitwist spindle and the winding-on means, a winding-on means rotatably mounted on said frame, means for providing rotary power to said winding-on means for operating said winding-on means,

a multitwist spindle rotatably mounted on said supporting frame, means connecting said multitwist spindle and said winding-on means for synchronizingly rotating the multitwist spindle with the rotation of the winding-on means.

4,222,222

OPEN-END FRICTIONAL SPINNING APPARATUS

Stanislav Dídek; Ludvík Fajt; Jaroslav Storek; Jaroslav Slingr; Frantisek Cada, and Marie Markova, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

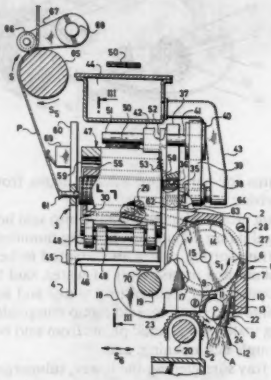
Filed Dec. 26, 1978, Ser. No. 973,025

Claims priority, application Czechoslovakia, Dec. 29, 1977, 8987/77

Int. Cl.³ D01H *1/135*

U.S. Cl. 57—58.95 **3 Claims**

1. In a spinning machine having a plurality of units for frictional spinning of yarn based upon the open-end spinning principle, each unit including a mechanism for supplying separated fibers onto a frictional surface of a pair of frictional surfaces provided on respective rotary carriers, a first one of said carriers being an inner carrier, a second of said carriers being an outer carrier, the first carrier being inserted in the second carrier, the two carriers being associated in contactless manner with each other so as to form a wedge-like gap in the mouth of which the fibers are twisted due to friction with the two frictional surfaces moving in opposite directions in said wedge-like gap, and a yarn take-off mechanism for withdrawing the yarn from said mouth of said wedge-like gap, said yarn take-off mechanism being adapted to prevent any twist propagation, one frictional surface being concave and the other frictional surface being convex relative to the yarn building region in the mouth of the wedge-like gap, the improvement wherein each unit has a first fiber supply duct for supplying



fibers, the first duct extending into said outer carrier, and a second duct situated opposite the first duct for delivering yarn withdrawn from the mouth of the wedge-like gap, the spinning machine having the open-end spinning units disposed side-by-side, the axis of rotation of the outer carrier of each unit being perpendicular to the longitudinal axis of the spinning machine, said longitudinal axis constituting a section line along which a horizontal plane and a vertical plane intersect each other and thus divide the machine into four quadrants, a sliver supply container being located in the quadrant in front of said vertical plane and below said horizontal plane, a yarn take-up mechanism being located at least in one of the quadrants behind the vertical plane.

4,222,223

HEATHER YARN MADE FROM BULKED CONTINUOUS-FILAMENT YARNS

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

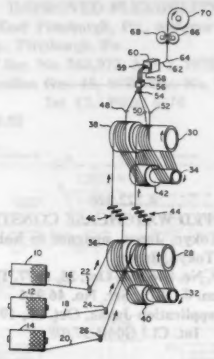
Filed Dec. 15, 1978, Ser. No. 969,933

Int. Cl.³ D02G *3/00, 3/02, 3/22*

U.S. Cl. 57—246 **4 Claims**

1. An improved, substantially twist-free, bulky, heather-dyeable, combined yarn comprises of at least two differentially dyeable types of randomly intermingled, continuous, crimped filaments wherein the improvement comprises having the filaments of one type, which type is lighter dyeing with respect to the other types, comprise from about 20% to about 50% of the total filaments in the combined yarn and have a length from about 15% to about 45% longer than the other filament types in the combined yarn, with the longer, lighter dyeing filaments forming numerous, crimped loops randomly distributed along

the surface of the combined yarn and which loops are held in place by filament wraps and interentanglement in the combined yarn sufficient to provide a mean separation distance by the lateral pull-apart test of no more than about 1.5 inches.



4,222,224

DEVICE FOR TEMPORARILY STOPPING THE OPERATION OF SPINNING STATIONS

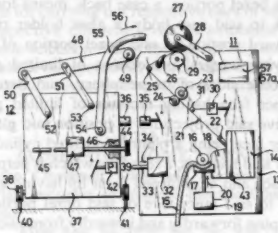
Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 16, 1976, Ser. No. 742,197

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552448

Int. Cl.[2] D01H *15/00, 11/00, 13/14, 13/24*

U.S. Cl. 57—263 **3 Claims**



1. Spinning machine, comprising a plurality of open-end spinning units and a movable servicing apparatus for servicing any of said spinning units; said servicing apparatus having associated therewith: means for servicing a spinning unit at which said servicing apparatus is stopped, and means for re-starting the spinning operation after servicing has been carried out; each spinning unit having associated therewith: means for interrupting the spinning operation, means for stopping said servicing apparatus at a spinning unit, means for sensing the arrival of said servicing apparatus at a spinning unit, monitoring means for determining when a preselected stage in the uninterrupted spinning operation at any spinning unit has been reached or exceeded and when said stage has been reached or exceeded and said sensing means has sensed the arrival of said servicing apparatus at said unit, for subsequently causing said stopping means to stop said servicing apparatus at said unit, for causing said interrupting means to interrupt the spinning operation at said unit, for causing said servicing means to service said unit, and for causing said re-starting means to re-start the spinning operation at said unit, means for detecting an unintentional thread breakage at any spinning unit and when a breakage has occurred, for immediately causing said interrupting means to interrupt the spinning operation at said unit, for subsequently causing said stopping means to stop said servicing apparatus at said unit, for causing said servicing means to service said unit, and for causing said re-starting means to re-start the spinning operation, and means associated with each spinning unit for deactivating said means for stopping said servicing apparatus at every spinning unit at which said preselected stage has been reached or exceeded but no unintentional thread breakage has occurred, if an unintentional thread breakage has occurred at any other spinning unit, whereby said spinning unit with an unintentional thread breakage will be serviced before any spinning unit at which said preselected stage has been reached or exceeded.

4,222,225

OPEN END SPINNING MACHINE HAVING PIECING APPARATUS

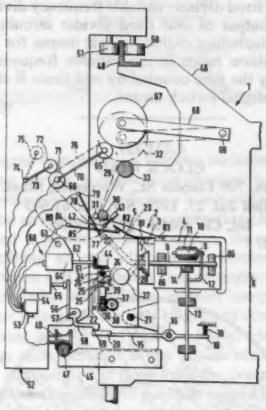
Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, and Heinz Schulz, Schumannstrasse 10, 7332 Donzdorf, both of Fed. Rep. of Germany, assignors to Hans Stahlecker and Heinz Schulz, both of, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,544

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2818794

Int. Cl.[3] D01H *15/02, 1/135*

U.S. Cl. 57—263 **12 Claims**



1. Open-end spinning machine comprising a spinning unit including:

a spinning rotor,

opening means for opening fibers,

fiber feed means for feeding fibers from said opening means to said spinning rotor,

vacuum source means for generating an air current which acts on said fibers to aid in feeding said fibers through said fiber feed means,

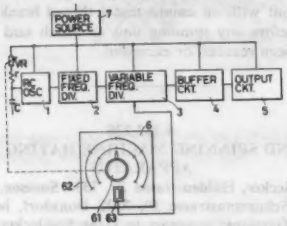
piecing apparatus including means for returning a thread end into the rotor for piecing onto a fiber ring deposited therein and for taking off the thus pieced thread, said piecing apparatus being equipped with additional devices for affecting the rotor speed and the quantity of fed fibers during the piecing step,

and additional air flow control means for controlling the air current produced by said vacuum source means at the fiber feed means during the piecing operation, whereby the transport of the fibers from the opening means to the spinning rotor can be influenced.

4,222,226
MULTI-RANGE TIMER

Osamu Miyatake; Hirotake Murakami, and Masakatsu Hishinuma, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 13, 1979, Ser. No. 11,828
Claims priority, application Japan, Feb. 14, 1978, 53/15669; Feb. 14, 1978, 53/15670
Int. Cl.[3] G04F 5/06, 5/10
U.S. Cl. 368—113 14 Claims

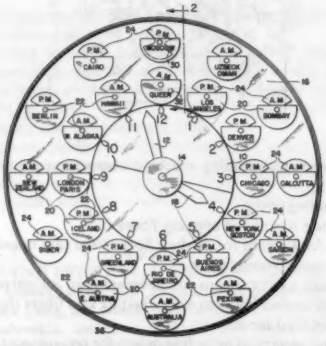


1. A multi-range timer comprising: a housing; a dial mounted on said housing; an RC oscillator having a variable resistor whose resistance is varied by rotation of said dial to vary the oscillation frequency of said oscillator; a fixed frequency divider circuit means receiving the output of said oscillator and dividing it by a fixed divisor; variable frequency divider means receiving the output of said fixed divider circuit; and time setting means including digital switch means for switching frequency dividsion ratios in the variable frequency divider means, whereby the time counted by said timer is changed by switching said digital switch means.

4,222,227.
CLOCK DIAL

Khachik Arabian, 700 Lincoln St., Worcester, Mass. 01605

Filed Jul. 27, 1979, Ser. No. 61,505
Int. Cl.[3] G04B 19/22, 19/06
U.S. Cl. 368—27 6 Claims



1. A clock comprising a conventional clock face, a minute hand, and means to drive an hour hand,

a transparent disc greater in diameter than the clock face, mounted to be rotated by the hour hand driver means,

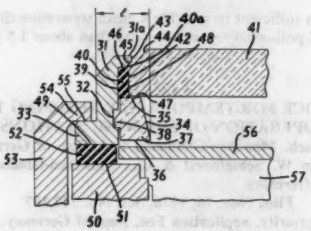
a series of rosettes located on the disc with a central area of the disc covering the conventional clock dial unimcumbered, an hour hand on the disc, and geographical indicia on each rosette, said rosettes being swingably mounted and weighted to retain their indicia to be read in a horizontal condition,

and a member for each rosette indicating in a selective relationship the AM or PM of the particular time at a particular location.

4,222,228
WATERPROOFED WATCHCASE CONSTRUCTION

Yasuyuki Masui, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 846,566, Oct. 23, 1977. This application Jun. 8, 1979, Ser. No. 46,924
Claims priority, application Japan, Oct. 28, 1976, 51/145262
Int. Cl.[3] G04B 37/08
U.S. Cl. 368—291 5 Claims



1. A waterproofed watchcase comprising a noncircular case body having a bezel portion, a case back, means for securing said case back to said case body, a glass holder ring fitting inside a rearward portion of said bezel portion of said case body and having integral projections of limited peripheral extent at opposite sides of its periphery, said bezel portion having an inner face having recesses of limited peripheral extent to receive said projections to position said glass holder ring, said inner face being a plain unindented cylindrical surface except for said recesses, a rear face which is perpendicular to said inner face and an inturned front lip having a rear face perpendicular to said inner face of said bezel portion, an inclined face sloping forwardly and inwardly from said rear face of said lip and an inner edge perpendicular to said rear face of said lip, a watch glass seated on said glass holder ring and having a front face, a peripheral edge surface parallel to and spaced from the inner face of said bezel portion and a peripheral sloping face joining said peripheral edge surface and said front face of said glass, said sloping face being parallel to and spaced slightly from said inclined face of said inturned front lip of said bezel portion, said glass being of a size larger than the area defined by said inner edge of said inturned front lip so that said glass extends beneath said lip, a first sealing ring of substantially rectangular cross section confined in an annular space defined by said bezel portion, said watch glass and said glass holder ring, said sealing ring having an inner face engaging said peripheral edge surface of said glass, a rear face engaging only the front face of said glass holder ring, an outer face engaging said plain inner face of said bezel portion, a front face engaging the rear face of said inturned front lip, and an inclined bead portion pressed into said space between said inclined face of said inturned front lip and said peripheral sloping face of said glass, and a second-sealing ring of substantially rectangular cross section confined between said rear face of said bezel portion and the front face of a rim portion of said case back.

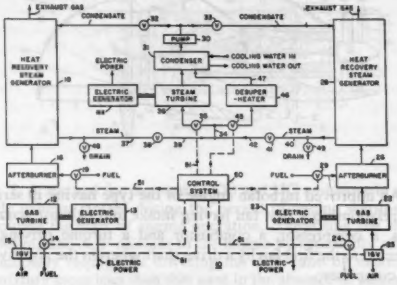
4,222,229
MULTIPLE TURBINE ELECTRIC POWER PLANT HAVING A COORDINATED CONTROL SYSTEM WITH IMPROVED FLEXIBILITY

Robert Uram, East Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 564,572, Apr. 2, 1975, abandoned. This application Oct. 18, 1978, Ser. No. 952,585

Int. Cl.³ F02C *6/18*

U.S. Cl. 60—39.03 **30 Claims**



1. A combined cycle electric power plant comprising at least one gas turbine and a steam turbine, a heat recovery steam generator connected to deliver steam to said steam turbine, an afterburner connected to deliver heat to said steam generator and connected to receive exhaust gas from said at least one gas turbine and adapted to impart further heat to said exhaust gas, a control system comprising at least an analog portion for operating said plant, said control system having (i) means for controlling the load operation of said steam turbine, (ii) means for controlling the load operation of said at least one gas turbine, and (iii) means for controlling the operation of said afterburner, said control system having coordinating logic means including control mode means for establishing a plurality of mode levels for carrying out respective ones of said load operations at respective different levels of automatic control, and control mode selection means for operatively selecting which of said mode level operations are carried out by said control system on which respective ones of said load turbines.

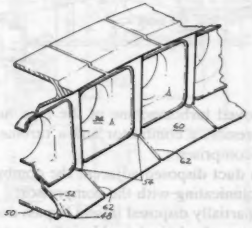
4,222,230
COMBUSTOR DOME ASSEMBLY

Melvin Bobo, Cincinnati, Ohio, and Thomas L. DuBell, Lake Park, Fla., assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 14, 1978, Ser. No. 933,221

Int. Cl.³ F02C *7/04*

U.S. Cl. 60—39.36 **3 Claims**



1. In a gas turbine engine combustor assembly including a pair of combustor liners radially spaced apart and forming a combustion zone therebetween, a dome assembly disposed between the liners and cooperating therewith to form an upstream end of the combustion zone, and an inlet cowl surrounding the dome assembly to define an inlet plenum upstream of the combustion zone, the improved dome assembly comprising:

an annular dome plate of generally V-shaped cross section including first and second legs extending from an apex portion thereof, said apex portion being disposed adjacent to one of the liners and downstream of said legs, said first leg extending upstream from said apex portion, generally parallel to and in abutting engagement with said one of the liners, said second leg extending upstream from said apex portion at an acute angle to said first leg and forming with said apex portion a surface exposed to the combustion zone, said dome plate including one or more circumferentially spaced apart slots extending generally radially through said first leg, said apex portion, and said second leg thereof.

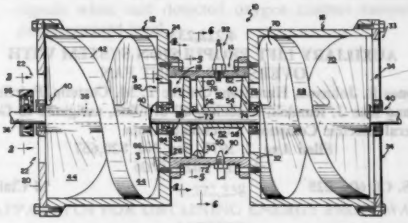
4,222,231
ENGINE

Wallace L. Linn, 6705 Grosvenor Pl., Indianapolis, Ind. 46220

Filed Jul. 20, 1978, Ser. No. 926,249

Int. Cl.³ F02C *5/00*

U.S. Cl. 60—39.45 **9 Claims**



1. An engine comprising: a housing including, in series, an inlet housing portion, a combustion chamber housing portion, the inlet housing portion defining a combustion-sustaining gas inlet end and an end adjacent the combustion chamber housing portion, and a power housing portion, the power housing portion defining an end adjacent the combustion chamber housing portion and an exhaust end; an engine shaft mounted for rotation within the housing; an inlet compressor element mounted for rotation in the inlet housing to compress combustion-sustaining gas for the engine; a power element mounted for rotation with the shaft in the power housing; first valve means for controlling the flow from the compressor housing into the combustion chamber housing; second valve means for controlling flow from the combustion chamber housing into the power housing; means for introducing fuel into the combustion chamber housing; means for igniting a fuel-gas mixture in the combustion chamber housing; and an accumulator for storing compressed combustion-sustaining gas, the accumulator being positioned between the inlet housing and the combustion chamber housing.

4,222,232
METHOD AND APPARATUS FOR REDUCING NITROUS OXIDE EMISSIONS FROM COMBUSTORS

Ronald L. Robinson, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

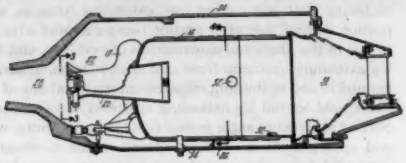
Filed Jan. 19, 1978, Ser. No. 870,787

Int. Cl.² F02C *7/22*

U.S. Cl. 60—737 **6 Claims**

1. A combustor structure having a combustion zone including a central portion and a radially outward portion encased by a cylindrical body, and having a fuel and air mixing zone upstream thereof which includes a main fuel and air mixing tube surrounded by a plurality of pilot fuel and air mixing tubes

wherein said main tube includes means for circumferentially swirling effluent dischargeable therefrom into the central portion of the combustion zone and wherein said pilot tubes are so



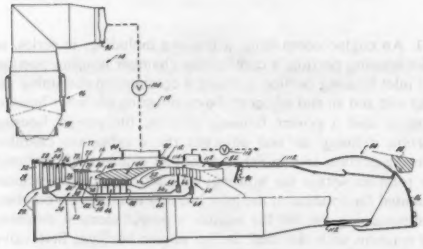
oriented as to cause effluent dischargeable therefrom to swirl circumferentially about the radially outward portion of the combustion zone in a direction opposite to the direction of swirl of the fuel/air mixture in the central portion.

4,222,233

AUXILIARY LIFT PROPULSION SYSTEM WITH OVERSIZED FRONT FAN

James E. Johnson, Hamilton; Onofre T. M. Castells, Fairfield, and Dan J. Rundell, Madeira, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 2, 1977, Ser. No. 820,657
Int. Cl.[2] F02K *9/06*
U.S. Cl. 60—225 **14 Claims**



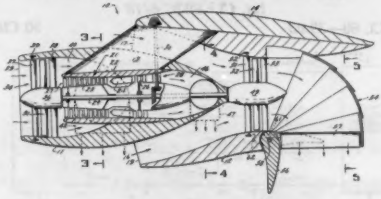
1. A propulsion system for use in V/STOL aircraft comprising a core engine for generating high energy products of combustion, a bypass duct, having upstream and downstream ends, that bypasses the core engine, a fan upstream of said core engine for pressurizing both a bypass flow stream and a core engine flow stream, said fan being oversized in air-pumping capability with respect to the aircraft cruise requirements of the core engine, a low pressure turbine, having means to vary the area of the turbine nozzle to extract varying amounts of energy from the products of combustion from the core engine for driving the fan at varying rotational speeds and for producing bypass flow in excess of core engine requirements during lift mode operation, valve means at the upstream end of the bypass duct for modulating the relative amounts of flow in the core engine flow stream and the bypss flow stream, a remote augmenter to which the bypass stream is ducted, mixed with fuel and burned to produce thrust in the lift operating mode, a nozzle with means for selectively vectoring thrust and for exhausting the core engine high energy products of combustion, and a continuation of the bypass duct for routing the bypass stream to the thrust vectorable nozzle when operating in other than the lift mode.

4,222,234

DUAL FAN ENGINE FOR VTOL PITCH CONTROL

Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 25, 1977, Ser. No. 818,471
Int. Cl.[2] F02K *3/06*
U.S. Cl. 60—226 R **29 Claims**



1. An improved turbofan engine of the type having in serial flow relationship a first fan having intake and exhaust nozzle means, a compressor, a combustor and a turbine drivingly connected to the first fan by a drive shaft wherein the improvement comprises:

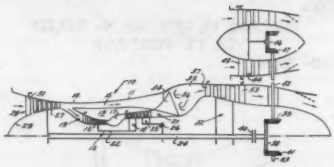
a second fan spaced axially from the first fan and having air intake and exhaust nozzle means independent from those of the first fan said second fan being spaced axially downstream from and drivingly connected to the turbine by the drive shaft and said second fan exhaust nozzle means being substantially axially spaced from that of said first fan.

4,222,235

VARIABLE CYCLE ENGINE

Arthur P. Adamson, Cincinnati, and Elmore V. Sprunger, Montgomery, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 25, 1977, Ser. No. 818,473
Int. Cl.[2] F02K *3/06*
U.S. Cl. 60—226 R **27 Claims**



1. An improved turbomachine of the type having in flow series a compressor, a combustor and a turbine wherein the improvement comprises:

(a) a bypass duct disposed adjacent the combustor and fluidly communicating with the compressor;

(b) a mixer partially disposed in said bypass duct for receiving a portion of relatively cold air from said compressor and a portion of relatively hot air from said combustor and presenting a mixed fluid to the turbine downstream for driving the compressor; and

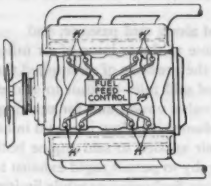
(c) a transfer turbine for receiving hot gases from the combustor, said transfer turbine being drivingly connected to the compressor by way of reduction gear means.

4,222,236

METHOD FOR REDUCING CO AND HC EMISSIONS

Louis Hegedus, Grosse Pointe Woods; Se H. Oh, Troy, both of Mich., and Kenneth Baron, Diamond Bar, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1978, Ser. No. 916,953
Int. Cl.[3] F01N *3/10*
U.S. Cl. 60—274 8 Claims



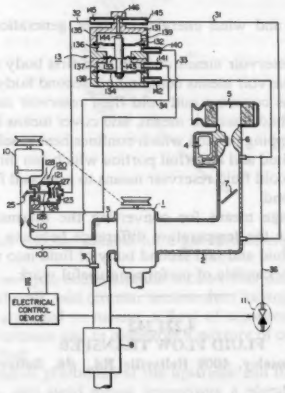
1. A method for decreasing CO and HC emissions in a vehicle exhaust stream during the period of engine warm-up following the start of engine operation, comprising the steps of pulsing the A/F mixture to the engine by repeatedly and continuously raising and lowering the A/F ratio by making said mixture more lean than that used in the absence of pulsing thus reducing the CO and HC content of the exhaust stream exiting the engine, each leaning step being followed by enriching the A/F mixture back up to the level used in the absence of pulsing thus increasing the amount of CO and HC in said vehicle exhaust stream, and repeating this pulsing continuously through said period of engine warm-up at a rate sufficiently rapid so as to preclude engine-stall, the use of the intermittent more lean A/F mixture serving to achieve a net more complete combustion of fuel in the engine with reduced CO and HC emissions.

4,222,237

EXHAUST GAS PURIFYING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Tokio Kohama, Nishio; Hideki Obayashi, Hoi; Tadashi Ozaki, Nishio, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 25, 1978, Ser. No. 936,850
Claims priority, application Japan, Aug. 29, 1977, 52-103480
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—276 16 Claims



1. In an exhaust gas purifying apparatus for internal combustion engines of the type having an intake conduit for supplying air-fuel mixture to the engine, an exhaust conduit for conducting exhaust gas discharged from the engine, said apparatus comprising secondary air supply means for supplying secondary air through a secondary air supply conduit to said exhaust conduit in a quantity in proportion to the operating speed of the engine, a catalyst disposed in said exhaust conduit downstream of the junction of said secondary air supply conduit to said exhaust conduit for purifying the exhaust gas, means for detecting oxygen content of the exhaust gas after having been mixed with the secondary air, and a secondary air control valve disposed in said secondary air conduit for controlling the quantity of secondary air to be supplied to said exhaust conduit in response to the detected oxygen content of said exhaust gas, the improvement comprising

first means for producing a first pressure signal representative of a quantity of intake air being supplied to the engine through said intake conduit.

second means for producing a second pressure signal representative of a quantity of said secondary air being supplied to said exhaust conduit through said secondary air supply conduit,

comparison means for comparing said first and second pressure signals to produce a control pressure signal for controlling said secondary air control valve, and

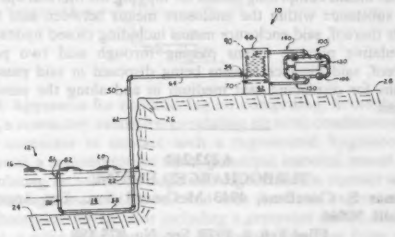
means for modulating one of said first and second pressure signals when said detected oxygen content exceeds a predetermined level.

4,222,238

APPARATUS FOR OBTAINING ENERGY FROM WAVE MOTION

Gary E. McCulloch, 1471 Etna Dr., Tulare, Calif. 93274

Filed Aug. 14, 1978, Ser. No. 933,415
Int. Cl.[3] F03B *13/12*
U.S. Cl. 60—398 10 Claims



1. In an apparatus for converting potential energy in a body of water to useful energy, comprising:

A. A water-filled conduit disposed near the surface of a body of water characterized by pressure varying in response to a series of waves moving across the surface of the body for inducing variations in the pressure of the water in said conduit;

B. means including a variable-volume chamber for alternately accepting and discharging flows of water in response to variations in the volume of the chamber;

C. pressure-transmitting means communicating with said conduit and with said chamber for varying the volume of the chamber in response to pressure variations induced in the fluid of the conduit; and

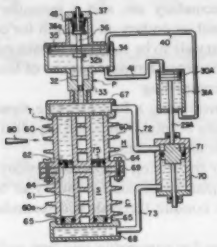
D. means connected in communication with the chamber for converting the energy of the flows of water to useful energy.

4,222,239

HEAT ENGINE

Masataka Negishi, 1000, Oaza-Ryoke, Urawa-shi, Saitama-ken, Japan

Filed Sep. 29, 1977, Ser. No. 837,921
Claims priority, application Japan, Sep. 30, 1976, 51-116596
Int. Cl.³ F03G 7/06
U.S. Cl. 60—527 **16 Claims**



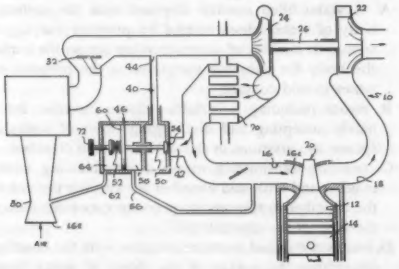
1. A heat engine comprising: pressure-tightly closed stationary enclosure means filled with a medium comprising a non-compressible thermal operating substance which changes in volume in accordance with temperature change; means forming a low temperature zone; means forming a high temperature zone greater in temperature than said low temperature zone; displacer means for subjecting said thermal operating substance in said enclosure means alternately to said high and low temperature zones to produce alternate volumetric expansion and contraction of the thermal operating substance; and power output means for converting said volumetric expansion and contraction into a mechanical displacement, said power output means including an output member slidably disposed in a portion of said enclosure means, said output member closing the enclosure means but being movable relative to the same in accordance with the expansion and contraction of said substance, said enclosure means including a part thereof surrounded by said high temperature zone and another part thereof surrounded by said low temperature zone, said displacer means comprising means for moving the thermal operating substance within the enclosure means between said two parts thereof, said enclosure means including closed hydraulic circulative passage means passing through said two parts thereof, said displacer means being disposed in said passage means for displacing said medium in and along the passage means.

4,222,240

TURBOCHARGED ENGINE

Thomas P. Castellano, 4943 McConnell Ave., Los Angeles, Calif. 90066

Filed Feb. 6, 1978, Ser. No. 875,180
Int. Cl.³ F02B 37/00
U.S. Cl. 60—611 **4 Claims**



1. In a turbo-charged engine which includes a cylinder, inlet and outlet conduits respectively leading to and from said cylinder, an exhaust turbine driven by exhaust gases moving along said outlet conduit, and a compressor driven by said exhaust turbine and disposed along said inlet conduit to supply compressed air to the engine, the improvement of means for limiting cylinder pressure, comprising:

a passage which couples locations along said inlet conduit lying respectively downstream and upstream of said compressor;

a valve located along said passage; and

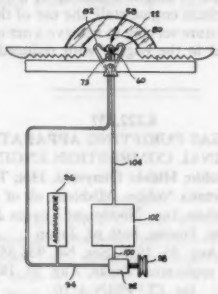
means responsive to the volume of air inflow into said inlet conduit and the pressure of air applied through the downstream end of said inlet conduit to said engine, for maintaining said valve closed and for opening said valve only when the volume air inflow into said inlet conduit and the pressure of air applied to said engine both exceed certain values, whereby to permit rapid exhaust turbine operation to lower engine backpressure while limiting air flow to the engine.

4,222,241

SOLAR AND WIND ENERGIZED POWER GENERATION DEVICE

John C. Wardman, 1060 San Tomas Aquino Rd., Campbell, Calif. 95008, and James Y. Adams, 26966 W. Fremont Rd., Los Altos Hills, Calif. 94022

Filed Jan. 11, 1979, Ser. No. 2,671
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641 **22 Claims**



1. A solar and wind energized power generation device comprising,

cold fluid reservoir means containing a first body of fluid,

hot fluid reservoir means containing a second body of fluid,

cover means covering said cold fluid reservoir means and said hot fluid reservoir means, said cover means including a heat trapping portion which confines heat in said second body of fluid and an airfoil portion which can direct wind past said cold fluid reservoir means to cool said first body of fluid, and

heat exchange means for converting the thermal energy residing in the temperature difference between said first body of fluid and said second body of fluid into mechanical energy capable of performing useful work.

4,222,242

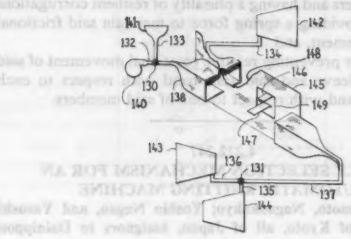
FLUID FLOW TRANSFER

Thomas S. Moseley, 4009 Beltsville Rd., #6, Beltsville, Md. 20705

Continuation-in-part of Ser. No. 706,698, Jul. 22, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,554
Int. Cl.³ F01B 21/00
U.S. Cl. 60—698 **24 Claims**

1. An apparatus for transferring energy from a first fluid

flow to a second fluid flow, comprising: a flow separating means having first and second sides and having said first fluid flow on said first side thereof and said second fluid flow on said second side thereof; said flow separating means dimensioned so that said first and second fluid flows are in contact with each other through a mutual free surface; a first vortex generator means supported within said first fluid flow and having a



vortex trailing lateral-most extent extending toward said free surface; a second vortex generator means supported within said second fluid flow and having a vortex trailing lateral-most extent extending toward said free surface; and means which transfers energy between work energy and fluid flow energy where the fluid flow involved in the energy transfer of said means is one of said first and second fluid flows and at most only some of the other flow.

4,222,243

FUEL BURNERS FOR GAS TURBINE ENGINES

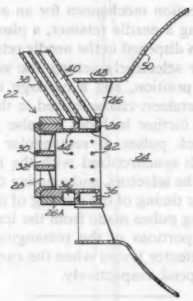
John A. Mobsby, Draycott, England, assignor to Rolls-Royce Limited, London, England

Filed May 24, 1978, Ser. No. 909,182

Claims priority, application United Kingdom, Jun. 10, 1977, 24345/77

Int. Cl.³ F02C 7/22

U.S. Cl. 60—742 **5 Claims**



1. A fuel injector suitable for a gas turbine engine comprising:

a hollow, open-ended circular section duct defining a cylindrical wall, said circular section duct having an upstream end arranged to receive a flow of compressed air and a downstream end to discharge a mixture of compressed air and fuel;

swirl means positioned at the upstream end of said circular duct, said swirl means comprising a plurality of spaced vanes extending inwardly from said cylindrical wall;

a centrally positioned, hollow, open-ended hub at the upstream end of said circular section duct, said inner ends of said vanes being supported by said hub;

a first set of fuel orifices in the wall of said cylindrical section duct adjacent the downstream end thereof for providing a low fuel flow rate at low power conditions of said engine;

a second set of fuel orifices in the wall of said circular section duct positioned upstream of said first set and downstream of said swirl means for providing a higher fuel flow rate at high power conditions of said engine;

fuel manifolds arranged to communicate respectively to said first and second sets of fuel orifices for supplying fuel thereto; and

a cylindrical wall spaced outwardly of the cylindrical wall of said circular section duct to define an annular air flow passage having an open, upstream end and an open, downstream end, said annular air flow passage being coaxial with said circular section duct and having its upstream end also coaxial with the upstream end of said circular section duct; and

a further swirl means in said annular air flow passage, said further swirl means including a plurality of spaced vanes.

4,222,244

AIR CONDITIONING APPARATUS UTILIZING SOLAR ENERGY AND METHOD

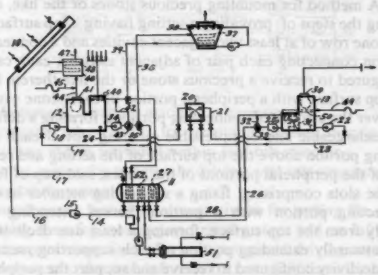
Gershon Meckler, Bethesda, Md., assignor to Gershon Meckler Associates, P.C., Washington, D.C.

Continuation of Ser. No. 777,049, Mar. 14, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,485

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.² F25B 27/00; F25D 23/00

U.S. Cl. 62—2 **17 Claims**



10. Apparatus for conditioning air comprising, in combination, a contactor, means for circulating air to be conditioned to said contactor in contact with a regenerated hygroscopic material, a regenerator for the hygroscopic material, means for circulating air to and through said regenerator in contact with hygroscopic material therein and then from said regenerator, an absorption refrigerator including a generator and an evaporator, a solar collector, means for transferring heat from said solar collector to said generator and to regenerate hygroscopic material in said regenerator whereby moisture from the spent hygroscopic material is removed by air circulated in contact therewith, and means for transferring heat of sorption developed in said contactor to the evaporator of said absorption refrigerator, and from thence to a heat sink.

4,222,245

SETTING FOR PRECIOUS STONES OR THE LIKE AND A METHOD FOR MOUNTING PRECIOUS STONES OR THE LIKE IN A SETTING

Jean Vitau, 18 Ackerman Ave., Oradell, N.J. 07649

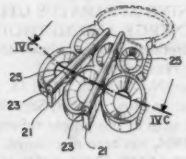
Filed Jan. 22, 1979, Ser. No. 5,369

Int. Cl.³ A44C 17/02

U.S. Cl. 63—28 **7 Claims**

1. A setting for precious stones or the like comprising: mounting means having a top surface and comprising at least one row of at least two adjacent cavities and a connection

portion connecting each pair of adjacent cavities, each cavity configured to receive a precious stone or the like therein from the top surface with a peripheral portion of each stone extending over the associated connecting portion, and securing means defining securing slots at each connecting portion and above the top surface of the mounting means for receiving the peripheral portion of the stones to be mounted to secure same in position in their cavities, said securing means comprising manually deformable means, upwardly deformable to enlarge each securing slot to effect insertion of the peripheral portion of the associated stone and downwardly reformable to compress each securing slot to fix the stone in position, said securing means further comprising a supporting member for each connecting portion and means fixedly mounting each supporting member in the associated connecting portion with a portion thereof extending outwardly of the top surface whereby each supporting member includes at least one declivity in the outwardly extending portion configured to receive and support the peripheral portions of the associated stones.



5. A method for mounting precious stones or the like, comprising the steps of: providing a setting having a top surface, at least one row of at least two adjacent cavities and a connection portion connecting each pair of adjacent cavities, each cavity configured to receive a precious stone or the like therein from the top surface with a peripheral portion of each stone extending over the associated connecting portions; forming a deformable enlargeable and compressible securing slot at each connecting portion above the top surface of the setting and receptive of the peripheral portions of the stones, said step of forming the slots comprising; fixing a supporting member in each connecting portion with a portion thereof extending outwardly from the top surface, forming a least one declivity in the outwardly extending portion of each supporting member, each declivity configured to receive and support the peripheral portion of the associated stone and fixing a deformable member on each supporting member configured to overlie the declivities therein; deforming the slots to enlarge same and inserting the stones in the cavities with the peripheral portions in the slots; and reforming the slots to compress same to secure the stone in place.

4,222,246

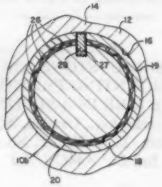
SLIP CLUTCH

Raymond A. Rongley, Newtown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Dec. 11, 1978, Ser. No. 968,253

Int. Cl.[2] F16D 7/02

U.S. Cl. 64—30 E **12 Claims**



1. In combination,

a rotary shaft member,

a member mounted on said shaft for movement therewith, and

a slip clutch interposed between said members and comprising

a split sleeve in surrounding relation to said shaft and in frictional engagement with one of said members,

a split band disposed between said sleeve and one of said members and having a plurality of resilient corrugations for providing a spring force to maintain said frictional engagement, and

means for preventing relative rotational movement of said split sleeve and said split band with respect to each other and with respect to one of said members.

4,222,247

NEEDLE SELECTION MECHANISM FOR AN AUTOMATIC KNITTING MACHINE

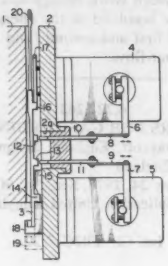
Takeji Hashimoto, Nagaokakyo; Yoshio Nagao, and Yasushi Doi, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Dec. 14, 1978, Ser. No. 969,337

Claims priority, application Japan, Jan. 7, 1978, 53/735

Int. Cl.[3] D04B 7/00, 15/66

U.S. Cl. 66—75.2 **7 Claims**



1. A needle selection mechanism for an automatic knitting machine comprising a needle retainer, a plurality of selectors for knitting needles disposed in the needle retainer, at least two selector levers for selectively setting the selectors to either "knit" or "welt" position, and a carriage adapted to move along the needle retainer, characterized in that:

the mechanism further includes a pulse generator which generates clock pulses of rectangular wave form and having a pitch synchronized with the movement of the carriage past the selectors, and a timing control circuit for controlling the timing of the moving of the selector levers by using timing pulses made from the leading edge or the trailing edge portions of the rectangular pulses for advancing the selector levers when the carriage is moved at high or low speed, respectively.

4,222,248

KNOCKOVER BAR ASSEMBLIES

Barry C. Strong, Syston; Eric W. Marriott, Shepshed, and William Clayton, Leicester, all of England, assignors to William Cotton Limited, Leicestershire, England

Filed Sep. 15, 1978, Ser. No. 942,634

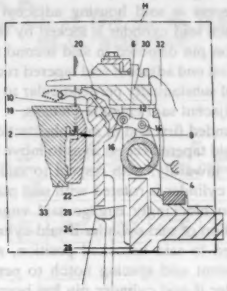
Claims priority, application United Kingdom, Sep. 17, 1977, 38845/77

Int. Cl.[2] D04B 11/00, 21/00

U.S. Cl. 66—82 R **8 Claims**

1. Straight bar knitting machine having a knitting head comprising a head rail, a needle bar carrying a multiplicity of needles, a sinker bar spaced rearwardly from said needle bar, a reciprocable knockover bar arranged between said needle bar and said sinker bar, a shaft extending along and to the rear of

said knockover bar, a plurality of mutually spaced bearing means rotatably supporting said shaft at spaced positions along its length for oscillation of said shaft and a plurality of means



interconnecting said knockover bar with said shaft at positions between pairs of neighboring bearing means for reciprocating said knockover bar upon oscillation of said shaft and resisting distortion of said knockover bar between its ends.

4,222,249
WARP KNITTING MACHINE WITH COMPOUND NEEDLES

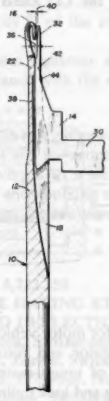
Karl Winter, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Apr. 5, 1979, Ser. No. 27,372

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815385

Int. Cl.[2] D04B *35/04*

U.S. Cl. 66—120 **17 Claims**



1. In a warp knitting machine having at least one guide bar, a needle bar having a plurality of slider needles thereon, and cooperating driving means, wherein each said slider needle comprises:

(a) a shank having a hook formed end portion, said shank having a slot provided therein, the bottom of said slot being provided with a raised portion at the end thereof proximate said hook formed end portion;

(b) a slider member disposed in said slot and slidably cooperating therewith, said slider member being driven by said driving means; and

(i) having one depressed end portion thereof extending from said shank across the mouth of said hook formed end portion of said shank acting to cooperate with and close said mouth in a first position and acting to open said mouth in a second position; and

(ii) having a remaining portion rearward of said depressed portion coming into contact with only said slot raised portion of the shank when said slider member is in its first position, said remaining portion and said raised portion being the only contact area between said shank and the hook formed end portion thereof and said slider member, the other end portion of said slider member being adapted to be coupled to said driving means for movement from said first to said second position.

4,222,250
AUTOMATIC WASHING MACHINE

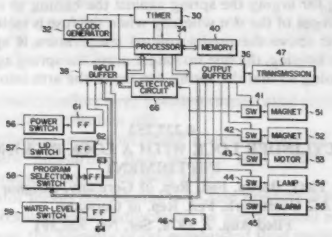
Fumio Torita, Nagoya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 21, 1979, Ser. No. 50,746

Claims priority, application Japan, Jun. 26, 1978, 53-77928

Int. Cl.[3] D06F *33/02*

U.S. Cl. 68—12 R **7 Claims**



1. Automatic washing machine comprising:

a rotatable tub structure for receiving washing therein;

agitating means provided within said tub structure;

driving means for selectively driving said tub structure and agitating means;

control means including a timer circuit for setting the operating time for washing and rinsing steps and an information processor circuit for energizing said driving means in response to the time information from said timer circuit to selectively drive said tub structure and agitating means thereby to execute the washing and rinsing steps; and

a transparency detector means for detecting the transparency of water used in the washing step at the initial stage thereof and for supplying an output signal corresponding to the transparency information thus detected to said information processor circuit, whereby said information processor circuit sets said timer circuit to set the operating time for at least one of said washing and rinsing steps.

4,222,251
ADDITIONAL LOCKING SYSTEM FOR COMBINATION LOCK

Tim M. Uyeda, South San Gabriel, Calif., assignor to Klaus W. Gartner, La Palma and Peter J. Phillips, Redondo Beach, both of, Calif., a part interest

Filed Sep. 8, 1978, Ser. No. 940,755

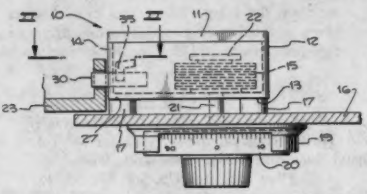
Int. Cl.[2] E05B *63/00*

U.S. Cl. 70—1.5 **6 Claims**

1. In a combination lock having a housing, a locking mechanism, a bolt in the housing movable between a first position projecting out of the housing and a second position generally withdrawn in the housing, means for moving the bolt to the second position only when the locking mechanism is in an unlocked condition, the improvement comprising:

additional locking means in the housing for locking the bolt

in the first position and heat responsive means for preventing the additional locking means from locking the bolt until the housing is heated above a predetermined temperature, the additional locking means comprises a spring mounted in the housing, the spring having an arm thereon and a pair of legs interconnected at a bight portion and a third leg connected to one leg of the pair of legs at the end opposite the bight portion, the arm depending from the



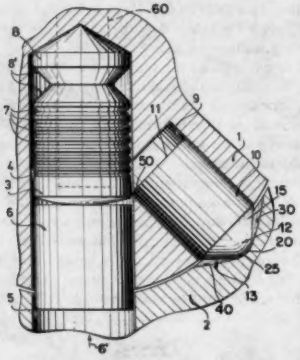
third leg, the bolt having a slot therein, means in the housing for mounting the spring such that the arm is adjacent the slot, the spring biasing the arm into the slot, the heat responsive means comprising a fuse in the housing for urging the spring against the biasing to retain the arm out of the slot whereby when the fuse is melted when heat above the predetermined temperature is applied to the housing, the fuse no longer urges the spring against the biasing so that the spring can move the arm into the slot.

4,222,252

CYLINDER LOCK WITH A LOCK PICKING IMPEDIMENT

Werner Tietz, Berlin, Fed. Rep. of Germany, assignor to Zeiss Ikon AG Goerzwerk, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,391
Int. Cl.[2] E05B *15/14, 29/04*
U.S. Cl. 70—364 A **10 Claims**



1. A cylinder lock having a lock housing with a cylinder, adapted to accept a key, rotatably mounted in the housing; the cylinder having at least one transverse boring corresponding to a boring in the housing with a cylinder pin disposed in the transverse boring and a spring biased locking pin disposed within the housing boring biased so that the locking pin is driven toward the cylinder and oriented so that the locking pin can enter the transverse boring, abutting an end of the cylinder pin, and thereby lock the cylinder from rotary movement; the cylinder pin being radially displaceable by a key to an unlocked position and operative to drive the locking pin out of the cylinder boring thereby unlocking the cylinder; the improvement comprising:

engaging means integrally affixed to the cylinder pin in a central region thereof with a spacing notch located between an interior end of said cylinder pin and said central region;

a second boring in the cylinder at an acute angle to the transverse boring and intersecting the transverse boring near a mid-region thereof;

a tapered recess in said housing adjacent to said second boring when said cylinder is locked by the locking pin;

an obstruction pin disposed in said second boring having a rounded first end adjacent said tapered recess and a planar second end substantially perpendicular to said obstruction pin and adjacent said engaging means;

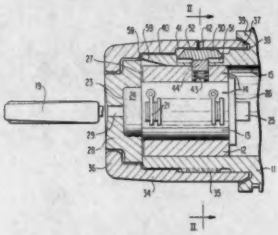
only said rounded first end of said obstruction pin cooperating with said tapered recess so as to move said obstruction pin axially inwardly, with respect to said second boring, when said cylinder is rotated with said planar second end operable to blockingly engage said engaging means to block rotation of said cylinder if said cylinder pin has not been moved to said unlocked position, and operable to move adjacent said spacing notch to permit rotation of said cylinder if said cylinder pin has been moved to said unlocked position.

4,222,253

STEERING LOCK FOR MOTOR VEHICLES

Karl Peitsmeier, Neuhausen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,601
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754372
Int. Cl.[2] E05B *63/00*
U.S. Cl. 70—417 **11 Claims**

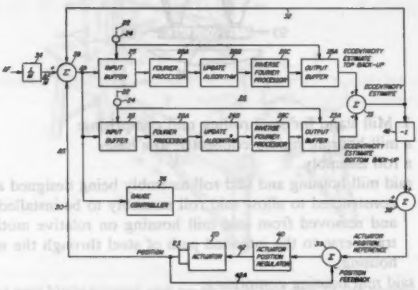


1. A steering lock for motor vehicles, comprising lock cylinder means having stator and rotor means, housing means, cover sleeve means of tough material at least partially surrounding the housing and lock cylinder means, and cap means adjoining the lock cylinder means within the area of the end face thereof, said cover sleeve means being provided at the inner wall thereof with a recess means, into which engages a locking pawl means against unauthorized removal of the cover sleeve means, said locking pawl means being disengageable for the disassembly of the lock cylinder means in a predetermined position of a key associated therewith and thus of the rotor means of the lock cylinder means, characterized in that the cover sleeve means is fastened at the housing means by a threaded connection secured against unscrewing and surrounds with play by means of a radially inwardly directed edge the cap means, said cap means being provided exclusively with a closely fitting opening for the insertion of the key.

4,222,254
GAUGE CONTROL USING ESTIMATE OF ROLL ECCENTRICITY

Eugene O. King, Jr., Murrysville, and D. Fred Stewart, Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 12, 1979, Ser. No. 19,580
Int. Cl.³ B21B *37/08*
U.S. Cl. 72—8 **3 Claims**



1. A method of controlling a rolling mill in which eccentricity of one or more of the roll assemblies of the mill and variations in thickness and/or hardness of material entering the mill ordinarily cause variations in the gauge of the material that exits from the mill, the eccentricity of the roll assembly or assemblies providing the material exiting the mill with a cyclic component, while the entering variations in thickness and/or hardness of the material provide the material exiting the mill with other transient components, the method comprising the steps of

estimating a change in material gauge Δh by use of the standard gaugemeter equation

$$\Delta h = \Delta S + (\Delta F/K)$$

estimating the eccentricity E of the roll assemblies of the mill,

correcting the gaugemeter equation with the estimate of eccentricity in accordance with the equation

$$\Delta h = E + \Delta S + (\Delta F/K)$$

until the cyclic component in exit gauge variation is reduced to a minimum or zero amount and the estimate of eccentricity in the equation thereby converges to a steady state value, and simultaneously processing and applying the estimate of gauge Δh in a manner that reduces the transient components in exit gauge to a minimum amount.

4,222,255
ROLLING DEVICE HAVING AT LEAST ONE CONTROLLED DEFLECTION ROLL

Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Mar. 26, 1979, Ser. No. 24,468
Claims priority, application Switzerland, Apr. 18, 1978, 4119/78
Int. Cl.³ B21B *37/08, 13/14, 29/00*
U.S. Cl. 72—20 **8 Claims**

1. A rolling mill for rolling a web of material comprising;

framework means;

at least one controlled deflection roll supported by said framework means;

said controlled deflection roll comprising;

a support fixedly mounted at said framework means;

a roll shell rotatable about said fixed support and radially movable in a pressure plane;

hydrostatic pressure elements for supporting the roll shell upon said support;

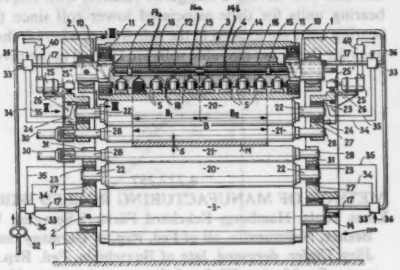
means for infeeding hydraulic pressurized fluid medium to said hydrostatic pressure element;

an intermediate roll for exerting pressure from the controlled deflection roll to a web of material which is being rolled;

said intermediate roll having opposed ends;

pressure sensors at which there are supported the ends of the intermediate roll in a given position at said framework means;

means cooperating with said pressure elements for subdividing the controlled deflection roll into at least two zones;



each zone extending over a predetermined axial extent of the controlled deflection roll;

said infeeding means including a separate line for the hydraulic pressurized fluid medium with which there is operatively connected each zone;

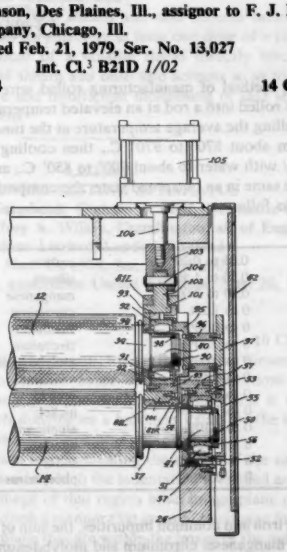
regulator means cooperating with said pressure sensors;

said pressure sensors influencing, by means of said regulator means, the pressure of the pressurized fluid medium such that the ends of the intermediate rolls are load relieved.

4,222,256
STRAIGHTENER WITH INDIVIDUALLY REMOVABLE ROLL AND PIVOTED BEARING HOUSING AND ROLL DESIGN

Kenneth C. Johnson, Des Plaines, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Feb. 21, 1979, Ser. No. 13,027
Int. Cl.³ B21D *1/02*
U.S. Cl. 72—164 **14 Claims**



1. A straightening machine for bending and straightening

metal stock, the combination with spaced side frames, of a lower pinch roll located at the entrance and also at the exit end of the machine, bearing units for each lower pinch roll having location in the side frames for mounting the pinch roll for rotation, an upper movable pinch roll for each lower pinch roll, pivot plates in pivotally connected relation with each side frame and having location adjacent the inside surface of a side frame, other bearing units for each upper movable pinch roll, said other bearing units having a fixed location in the pivot plates respectively, for journalling the upper movable pinch rolls and which accordingly have bodily movement when the pivot plates are actuated, the said bear-units for each upper movable roll having a staggered relation with respect to the bearing units for their associated lower roll since the latter bearing units are located in the side frames whereas the bearing units for the upper movable rolls are located in the pivot plates.

4,222,257

METHOD OF MANUFACTURING ROLLED WIRE ROD

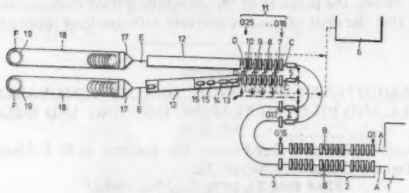
Klaus Theis, Hamburg; Eckehard Förster, Seevetal; Wolfram Becher, Neümunster, all of Fed. Rep. of Germany, and Hans-Jörg Töpfer, deceased, late of Buxtehude, Fed. Rep. of Germany (by Marion Töpfer, heiress), assignors to Hamburger Stahlwerke GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 848,911

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717780

Int. Cl.³ B21B *45/02;* **C21D** *8/06, 9/52*

U.S. Cl. 72—201 **9 Claims**



1. A method of manufacturing rolled wire rod, wherein a steel is rolled into a rod at an elevated temperature comprising controlling the average temperature at the time of final rolling at from about 870° to 970° C., then cooling the same very rapidly with water to about 700° to 850° C., and further cooling the same in an outspread state, the composition of the steel being as follows:

0.05 to 0.20%	carbon
0.50 to 1.50%	silicon
0.80 to 3.00%	manganese
0 to 1.2%	chromium
0 to 0.30%	titanium
0 to 0.30%	zirconium
0 to 0.60%	molybdenum
0 to 0.40%	vanadium
0 to 0.50%	copper
0 to 1.50%	nickel
0 to 0.10%	aluminum
0 to 0.020%	nitrogen
0 to 0.040%	sulfur
0 to 0.040%	phosphorus

balance iron and common impurities, the sum of the contents of silicon, manganese, chromium and molybdenum amounting to more than 1.5%.

4,222,258

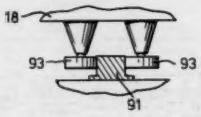
MILL STAND

Michael F. Field, Oshawa, Canada, assignor to Co-Steel International Limited, Whitby, Canada

Filed Nov. 17, 1978, Ser. No. 961,756

Int. Cl.³ B21B *13/08, 31/08*

U.S. Cl. 72—239 **6 Claims**



1. Mill stand for steel rolling mill comprising:
a mill housing rigidly connected to a base,
a roll assembly,
said mill housing and said roll assembly being designed and constructed to allow said roll assembly to be installed in and removed from said mill housing on relative motion transverse to the intended path of steel through the mill housing,
said mill housing comprising:
a pair of standards on each side of the intended steel path therepast,
each said pair of standards being structurally joined by a junction member adjacent their upper ends,
at least one of said pairs with its junction member defining a window for movement of a roll assembly into and out of said path,
hydraulically actuated piston means associated with each said junction member for exerting a downward pressure on a roll assembly mounted in said housing,
said roll assembly comprising,
a lower horizontal roll mounting member,
an upper horizontal roll mounting member designed to rest on and be supported by said lower horizontal roll mounting member,
means in said assembly for adjusting the height and axial attitude of said upper roll relative to said lower roll while said assembly is outside said housing,
said assembly being designed to be moved approximately horizontally into a mill housing,
means in said assembly for adjusting the height and axial attitude of said upper roll relative to said lower roll, while said assembly is outside said housing,
said roll assembly being so designed that, when installed, each said piston means may be hydraulically actuated to exert pressure,
to clamp said upper horizontal roll assembly downwardly against said lower horizontal roll assembly.

4,222,259

PROPELLER RECONDITIONER

Norman E. Junes, Rte. 3, Box 148, Astoria, Oreg. 97103

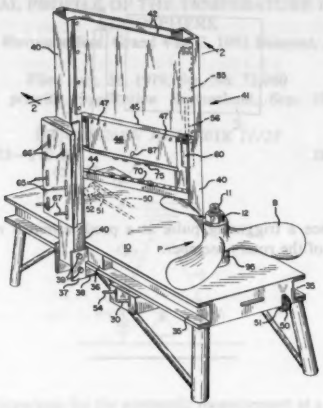
Filed Jul. 16, 1979, Ser. No. 57,945

Int. Cl.³ B21D *1/00*

U.S. Cl. 72—293 **20 Claims**

1. A propeller reconditioner comprising means to hold the propeller in a fixed position, an anvil beam extending transversely of one blade of the propeller and arranged to engage one side of said blade, a presser foot beam approximately parallel with said anvil beam and having a shoe arranged to engage the opposite side of said blade, means operable on said beams to clamp said blade between the beams, means operable

on said beams to tilt said beams relative to the axis of the propeller, and means to shift said beams in a radial direction



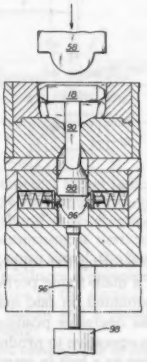
along said blade toward and away from said axis of the propeller.

4,222,260

WARM FORGING OF CONNECTING ROD CAPS

Richard P. McDermott, Troy, Mich., assignor to WSP Industries Corporation, Center Line, Mich.

Filed May 15, 1978, Ser. No. 905,831
Int. Cl.³ B21D *45/00*
U.S. Cl. 72—345 **13 Claims**



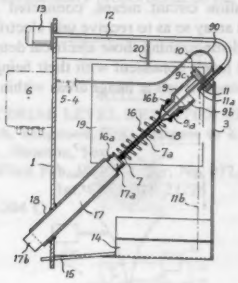
1. In a method of warm forging complex parts in a closed die, a use of an ejector pin comprising the sequential steps of:
   1. using said ejector pin when at a predetermined intermediate position between fully retracted and fully extended to act as a locating means for a new billet dropped into the female die;
   2. using said ejector pin when at its fully retracted position to act as part of the mold cavity to define a portion of the part to be forged therein; and
   3. using said ejector pin when at a fully extended position to act conventionally to eject a finished part.

4,222,261

DEVICE FOR MEASURING THE WATER CONTENT OF A MOVING GAS

Michel Leblanc, Roncq; Jacques Lanérés, Bondues, and Jean Perrin, La Chapelle d'Armentieres, all of France, assignors to Institut Textile de France; Michel Leblanc and Agence Nationale de Valorisation de la Recherche (ANVAR), all of, France

Filed Jan. 15, 1979, Ser. No. 3,752
Claims priority, application France, Jan. 16, 1978, 78 01123
Int. Cl.³ G01N *25/62*
U.S. Cl. 73—29 **7 Claims**



1. A psychrometer for measuring the water content in a flow of gas, comprising:
   support means;
   first sensor means mounted on said support means and located directly in said flow gas for measuring the dry temperature of said flow of gas;
   second sensor means mounted on said support means for measuring the wet temperature of said flow of gas;
   a sheath surrounding said second sensor means and also located in said flow of gas, said sheath being adapted to absorb a volatile liquid;
   a pair of screens mounted on opposite sides of said second sensor means and said sheath for protecting said sheath against thermal radiation; and
   means for wetting said sheath and said screens including injecting means for injecting at least one dose of a predetermined amount of a volatile liquid directly into the interior of said sheath and onto said screens so as to prevent excessive and insufficient moistening of said sheath and said screens.

4,222,262

HARDNESS TESTING APPARATUS

John N. Batie, Gateshead; Graham T. Relf, Newcastle-upon-Tyne, and Geoffrey A. Wilkin, Cramlington, all of England, assignors to Vickers Limited, London, England

Filed Nov. 17, 1978, Ser. No. 961,605
Claims priority, application United Kingdom, Nov. 25, 1977, 49235/77
Int. Cl.³ G01N *3/48*
U.S. Cl. 73—81 **10 Claims**

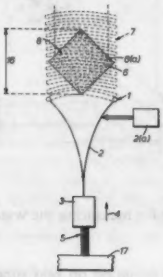
1. Hardness testing apparatus, for use in assessing dimensions of an indentation formed under controlled conditions in a region of a surface of a specimen whose hardness is to be tested, from which dimensions a hardness value for the specimen can be derived, the apparatus comprising:
   (a) imaging means for illuminating the region of the surface of the specimen in which the indentation is formed and for forming an image of that region in an image plane of the apparatus, in such a manner that areas of the image formed in the image plane that are within the image of the indentation differ in brightness from areas of the image formed in

the image plane that are outside the image of the indentation;

(b) a one-dimensional array of photosensitive elements arranged at the image plane for sensing brightness levels at image areas distributed over the image formed in the image plane and operable to deliver electrical detection signals having electrical levels representative of the brightness levels at the image areas;

(c) scanning means for causing relative scanning motion between the array and the image of the region of the surface in which the indentation is formed, perpendicularly of the line of the array;

(d) discrimination circuit means, connected to said one-dimensional array so as to receive said electrical detection signals, for distinguishing those electrical detection signals of electrical levels consistent with their being representative of brightness levels at image areas within the image of



the indentation from those electrical detection signals of electrical levels consistent with their being representative of brightness levels at image areas outside the image of the indentation, and for providing discrimination signals of a first level when the received electrical detection signals are of a level consistent with their being representative of brightness at image areas within the image of the indentation, and of a second level when the received electrical detection signals are of a level consistent with their being representative of brightness at image areas outside the image of the indentation; and

(e) correlation means for receiving the discrimination signals from said discrimination circuit means and for deriving, in dependence upon the correlation of discrimination signals of the first and second levels respectively in relation to the respective different image areas of the image formed in the image plane, an assessment of dimensions of the indentation.

4,222,263

CRANKSHAFT POSITION TRANSDUCER SYSTEM

Clifford M. Armstrong, Leek Wootton, England, assignor to Lucas Industries Limited, Birmingham, England

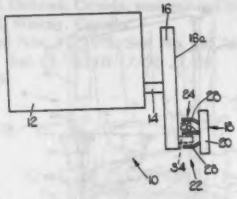
Filed Mar. 5, 1979, Ser. No. 17,658

Claims priority, application United Kingdom, Mar. 18, 1978, 10821/78

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **4 Claims**

1. A crankshaft position transducer system comprising an internal combustion engine having a crankshaft, a rotary member mounted to rotate at a speed proportional to the speed of rotation of the crankshaft, at least one pair of refrence elements mounted on the rotary member at radially and circumferentially spaced locations, and a transducer head including a pair of individual transducers, the transducer head being positioned and arranged so that each individual transducer co-operates with a respective one of the or each pair of reference elements



to produce a triggering pulse at a predetermined rotational position of the rotary member.

4,222,264

YARN MONITORING DEVICE

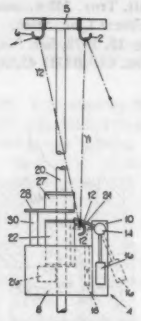
William E. A. Shelton, Leicester, England, assignor to Alan Shelton Limited, Croft, England

Filed Oct. 10, 1979, Ser. No. 83,235

Claims priority, application United Kingdom, Oct. 12, 1978, 40374/78

Int. Cl.³ G01L *5/04;* **D01H** *13/16, 13/22*

U.S. Cl. 73—160 **9 Claims**



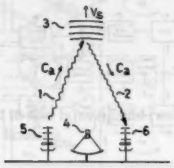
1. A device for monitoring the supply of yarn to a textile machine, comprising a main frame portion, a pivotable yarn-contacting member mounted on said main frame portion for movement between an operative position and an inoperative position, signal means operative to produce a signal for bringing said textile machine to a halt in response to movement of said pivotable member into said operative position, means biassing said pivotable member towards said operative position, a support member mounted for movement into and out of a predetermined position relative to said main frame portion, and yarn-engaging means secured to said support member, said support member occupying said predetermined position when said yarn is supplied at normal tension and said yarn-engaging means holding said yarn in contact with said pivotable member so as to hold said pivotable member in said inoperative position, snatching or breakage of said yarn causing said yarn to be removed from its contact with said pivotable member so that said pivotable members moves into said operative position.

4,222,265

APPARATUS FOR AUTOMATICALLY MEASURING THE VERTICAL PROFILE OF THE TEMPERATURE IN THE ATMOSPHERE

Pierre E. Ravussin, Res. Grand Vue C, 1092 Belmont, Switzerland

Filed Aug. 31, 1979, Ser. No. 72,060
Claims priority, application Switzerland, Sep. 19, 1978, 9746/78
Int. Cl.³ G01W 1/02; G01K 11/24
U.S. Cl. 73—170 R 10 Claims



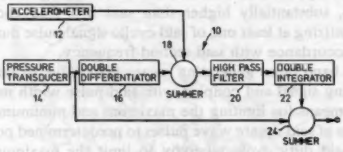
1. An apparatus for the automatic measurement at a distance of the vertical profile of the atmospheric temperature comprising a controlled continuous Doppler radar which measures the speed of propagation of the sonic pulse, means for emitting said sonic pulse, means for correcting for the effect of the vertical speed of the wind and means for measuring said vertical speed of the wind.

4,222,266

BODY MOTION COMPENSATION FILTER WITH PITCH AND ROLL CORRECTION

Samuel M. Theodoulou, 23 Greenmount Rd., Bramalea, Ontario, Canada

Filed Aug. 13, 1979, Ser. No. 65,782
Claims priority, application Canada, Aug. 17, 1978, 309540
Int. Cl.³ G01S 15/10, 15/89
U.S. Cl. 73—179 7 Claims



1. For use in generating a signal indicative of the vertical displacement of a body travelling through water relative to a datum, the body containing an accelerometer that produces an acceleration signal comprising a vertical acceleration signal and an accelerometer noise signal, the body containing a pressure transducer that produces a pressure signal comprising a position signal indicative of the vertical displacement of the body relative to the datum and a pressure transducer noise signal, a filter comprising:

differentiation means connectable to the pressure transducer for producing a differentiated signal proportional to the second derivative of the pressure signal;

first summing means, connected to the differentiation means and connectable to the accelerometer, for producing a first summation signal proportional to a weighted sum of the differentiated signal and the acceleration signal, the weighting being such that components of the first summation signal corresponding to the second derivative of the position signal and to the vertical acceleration signal cancel one another, whereby the first summation signal consists essentially of signal components proportional to the accelerometer noise signal and to the second derivative of the pressure transducer noise signal;

integration means connected to the first summing means for producing an integrated signal proportional to the double integral of the first summation signal, the integration means including attenuating means for attenuating zero frequency components of the integrated signal; and,

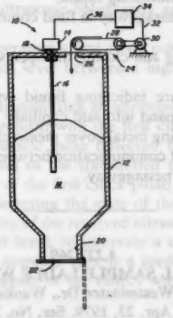
second summing means, connected to the integration means and connectable to the pressure transducer, for producing a second summation signal proportional to a weighted sum of the integrated signal and the pressure signal, the weighting being such that components of the second summation signal corresponding to the pressure transducer noise signal cancel, whereby the second summation signal is substantially proportional to the position signal.

4,222,267

MATERIAL LEVEL DETECTOR CIRCUIT

Joe L. Aldrich, Kingwood, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Feb. 10, 1978, Ser. No. 877,028
Int. Cl.² G01F 23/26
U.S. Cl. 73—304 C 47 Claims



1. Apparatus for detecting the presence or absence of material at a location comprising:

(a) signal generation means for providing an oscillatory signal;

(b) antenna probe means for positioning at said location, and for receiving said oscillatory signal;

(c) converter means for producing a voltage level whose value is dependent on the amplitude of said oscillatory signal;

(d) switching means, operable by said voltage level, for producing an output signal dependent on the presence or absence of material at said location;

(e) comparator means, as part of said switching means, whose output controls said output signal depending on the value of said voltage level produced by said converter means compared to a reference voltage level;

(f) sensitivity control means, for selectively adjusting the sensitivity of response of said switching means, including voltage selection means for selectively providing voltage levels to said switching means to selectively determine the value of said reference voltage level whereby the magnitude of the variation of said voltage levl, produced by said converter means, required to effect a change in said output signal is so selectively determined; and

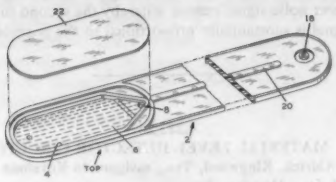
(g) said voltage selection means further comprising a voltage divider including a plurality of resistors, and sensitivity switch means for selectively communicating voltages from contacts between resistors in said voltage divider to said switching means to so selectively determine the value of said reference voltage level.

4,222,268

DISPOSABLE THERMOMETER

Mishel Greenberg, 105 Patton Blvd., New Hyde Park, N.Y. 11040; Michael Kearney, 89 PomonaAve., Milford, Conn. 06460, and Milton P. Chernack, 399 June Pl., West Hempstead, N.Y. 11552

Filed Jul. 25, 1979, Ser. No. 60,610
Int. Cl.[3] G01K *5/08*
U.S. Cl. 73—371 11 Claims



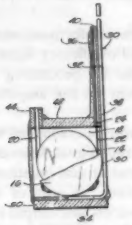
1. A thermometer comprising:
(a) a plastic thermometer body having a relatively large recess on one side of said body forming a reservoir for a temperature indicating liquid;
(b) a capillary passageway in fluid communication with said reservoir;
(c) a lid covering and closing the open side of said capillary passageway;
(d) a temperature indicating liquid within said reservoir adapted to expand into said capillary passageway; and
(e) heat conducting metal cover means closing said reservoir so as to permit communication between said reservoir and said capillary passageway.

4,222,269

MOLTEN METAL SAMPLE LADLE WITH VENT TUBE

Richard Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Apr. 23, 1979, Ser. No. 32,436
Int. Cl.[3] G01N *1/12*
U.S. Cl. 73—425.4 R 2 Claims



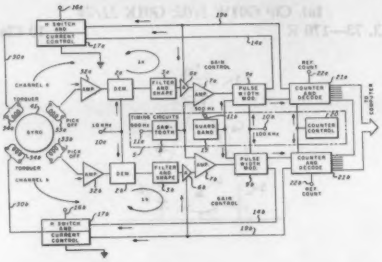
1. A molten metal sampler comprising opposed mold halves having a rectangular shape and opposed recesses defining a sample cavity, opposed recesses forming a fill passage and a vent passage along the upper edge of said mold halves, a handle having a bent portion at right angles with a stem portion and said sample mold having side and bottom edges respectively cemented to said stem portion and bent portion, upper and lower discs cemented to said top and bottom edges of said sample mold and an insulative jacket arranged around said discs and said handle to isolate said mold halves including a protective disc above said wall means defining the sample cavity, said fill tube extending through an opening in said disc and said vent tube extending through a second opening in said disc, and a protective shroud surrounding said wall means and interfitting with said protective discs.

4,222,270

GYROSCOPE RATE RANGE SWITCHING AND CONTROL SYSTEM

Arnold R. Allen, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,306
Int. Cl.[2] G01C *21/10*
U.S. Cl. 73—504 13 Claims



1. Apparatus for use with an inertial sensor of the force rebalance type wherein the current supplied to the sensor torquer required to nullify the sensor pick-off signal indicative of an inertial force acting thereon is proportional to such inertial force, said apparatus comprising:
timing signal generator means for providing a plurality of time related signal frequencies,
pulse width modulator means responsive to a first of said timig signal frequencies and to said sensor pick-off signal for providing substantially square wave signal pulses having positive and negative pulse durations proportional to said pick-off signal with a duty cycle corresponding to the period of said first signal frequency,
means responsive to said square wave pulses for providing corresponding currents to said sensor torquer in a sense to null said sensor pick-off signal,
means responsive to a second of said timing signal frequencies, substantially higher than said first frequency, for quantizing at least one of said cyclic signal pulse durations in accordance with said second frequency,
guard band pulse generating means responsive to said first timing signal and coupled with said pulse width modulator means for limiting the maximum and minimum durations of said square wave pulses to predetermined portions of said duty cycle whereby to limit the maximum and minimum pulse durations supplied to said torquer current providing means, and
counter means responsive to said quantized pulse duration signal as limited by said pulse generating means for providing a count during the effective pulse duration of said one signal pulse duration.

4,222,271

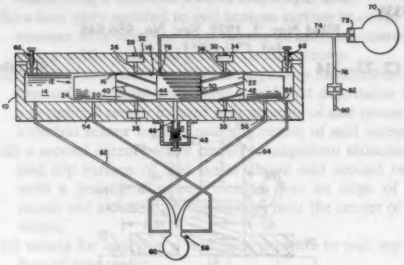
DIGITAL FLUIDIC OUTPUT FORCE BALANCE ACCELEROMETER

James V. Johnston, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1979, Ser. No. 11,480
Int. Cl.[3] G01P *15/03*
U.S. Cl. 73—515 7 Claims

1. A digital output accelerometer comprising a housing having a chamber therein, a proof mass rotatably mounted therein by frictionless bearing means, means for rotating said proof mass up to a predetermined operating speed, means for balancing pressures at opposite ends of said proof mass, and fluid pickoff means including rotating means on a portion of

said proof mass and fixed means on said housing and cooperating and producing a fluidic digital output in response to acceleration forces applied to said housing and rotation of said proof mass relative to said housing.

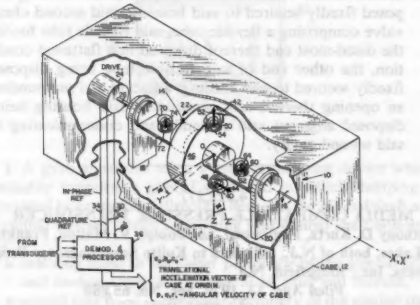


4,222,272

PROCESSOR FOR AN INERTIAL MEASUREMENT UNIT

Theodore Mairson, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 27, 1978, Ser. No. 890,354
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—517 R 17 Claims



1. A processor for an inertial measurement unit that includes a number of linear acceleration transducers on a single rotor, at least one of said transducers mounted on said rotor such that the sensitive axis of said transducer is offset from and parallel to the rotor axis, and at least one other transducer having a sensitive axis, the center of sensitivity of which is located on the rotor axis, comprising:

means for demodulating the outputs of said transducers; and

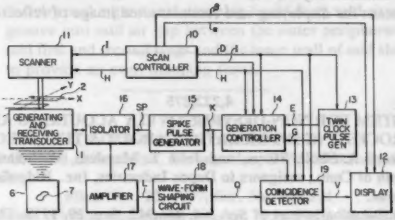
means for processing the demodulated outputs of said transducers so as to obtain the translational acceleration and angular velocity of said unit in three mutually orthogonal directions, said processing means including means for deriving a set of dynamic variables which define said translational acceleration and said angular velocity in terms of linear combinations of selected demodulator outputs.

4,222,273

DIGITAL TYPE ULTRASONIC HOLOGRAPHY APPARATUS

Fuminobu Takahashi, Kanagawa; Takahiro Kanamori, Tokyo, and Kazumichi Suzuki, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 21, 1978, Ser. No. 917,600
Claims priority, application Japan, Jun. 22, 1977, 52-73206; Sep. 28, 1977, 52-115619
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—603 12 Claims



1. A digital type ultrasonic halography apparatus comprising:

first means for generating a first clock pulse which changes periodically in its level between a high state and a low state,

second means for transmitting an ultrasonic pulse toward an object in synchronism with the first clock pulse, and receiving an ultrasonic pulse reflected by the object, the repetition interval of the transmitted pulse being larger than the period of the first clock pulse, and

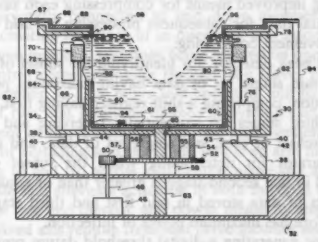
third means for detecting the state of the first clock pulse when the intensity of the received ultrasonic pulse reaches a predetermined level, to generate a coincidence signal only when the detected state is a predetermined one, to produce a hologram of the object with the coincidence signal.

4,222,274

ULTRASOUND IMAGING APPARATUS AND METHOD

Steven A. Johnson, 136 N. First West, Preston, Id. 83772

Filed Sep. 15, 1978, Ser. No. 942,740
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—607 41 Claims



1. An ultrasound imaging apparatus for reconstructing images of reflection from synthetically focused ultrasound energy, said apparatus comprising:

means for transmitting ultrasound energy signals;

means for receiving ultrasound energy signals that have been either reflected by or transmitted through an object being scanned by said apparatus;

means, electronically connected to said receiving means, for electronically storing said received ultrasound signals;

means for developing a particular type of waveform for each said stored signal such that when said stored signals are combined so as to reconstruct therefrom an image of reflection, regions of both constructive and destructive interference will occur, said regions improving the point response of said combined signals so as to enhance the resolution of said reconstructed image of reflection;

means, electronically connected to said storage means, for combining said stored signals so as to reconstruct therefrom said image of reflection corresponding to said scanned object; and

means for displaying said reconstructed image of reflection.

4,222,275

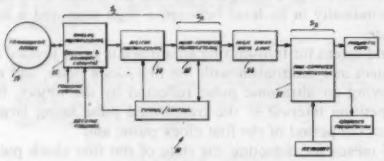
SYSTEM FOR NON-DESTRUCTIVELY ACQUIRING AND PROCESSING INFORMATION ABOUT A TEST PIECE

Howard A. Sholl, Storrs, and John T. Marshall, Willimantic, both of Conn., assignors to Dapco Industries, Inc., Ridgefield, Conn.

Continuation-in-part of Ser. No. 946,942, Sep. 29, 1978. This application Oct. 2, 1978, Ser. No. 947,481

Int. Cl.[2] G01N 29/04

U.S. Cl. 73—636 **9 Claims**



1. In a system for non-destructively acquiring and processing information about a test piece, including an array of ultrasonic transducers each adapted to transmit ultrasonic energy into the test piece and to receive ultrasonic energy transmitted back thereto to produce a response signal capable of representing deviation from the expected condition of the test piece, means for transporting said array relative to said test piece, means for sequentially pulsing said transducers while transported relative to the test piece to ultrasonically inspect said test piece and produce a set of said response signals representing the inspection, means of sequentially monitoring each of said response signals, and means for converting each said monitored response signal to a single set of digital data; the improvement comprising improved means for compressing each said single set of digital data for subsequent processing by said system, said improvement comprising:

a digital peak detector, for identifying the subset of data in each said single set of data having maximum points of inflection, comprising a shift register having first, second and third stages for sequentially receiving and storing each subset of each said single set of data, and a subset comparator for determining when the subset of data stored in said second stage is greater than or equal to the subsets of data stored in said first and third stages and therefore has maximum points of inflection,

means for generating a digital threshold datum representative of acceptable background noise characteristic of each said response signal,

means for receiving said subsets of data having maximum points of inflection from said subset comparator and for then comparing said subsets of data having maximum points of inflection and said threshold datum; and

means for storing only said subsets of data of said single sets of data which are greater than said threshold datum, for subsequent processing by said system.

4,222,276

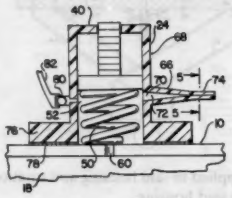
VACUUM PACKING APPARATUS

Ronald A. DeRogatis, P.O. Box 4943, Ft. Lauderdale, Fla. 33338

Filed Nov. 2, 1978, Ser. No. 956,948

Int. Cl.[3] G01L 7/16

U.S. Cl. 73—714 **9 Claims**



1. A vacuum packing apparatus comprising a container, a lid, said container and said lid being disposed removably secured to one another, forming an enclosed cavity thereby,

a first check valve, said first check valve pneumatically coupled to said cavity and carried by the assembly of said lid and said container, said first check valve being disposed biased into a closed condition when said cavity experiences negative pressure,

a housing, said housing being carried by said assembly, said housing having a second cavity therewithin, said second cavity being pneumatically coupled to said cavity,

a plunger, said plunger being disposed slideably secured within said second cavity,

a rod, said rod being disposed fixedly to said plunger, said housing having an opening, said rod passing through said opening, means to bias said rod and said plunger towards said opening, whereby said plunger and said rod are disposed towards said cavity when said cavity is under the influence of a negative pressure therewithin,

a second check valve, said second check valve being disposed fixedly secured to said housing, said second check valve comprising a flexible tube, said flexible tube having the distal-most end thereof disposed in a flattened condition, the other end of said flexible tube being disposed fixedly secured to said housing, adjacent and surrounding an opening therein, said opening of said housing being disposed adjacent said assembly and communicating to said second cavity.

4,222,277

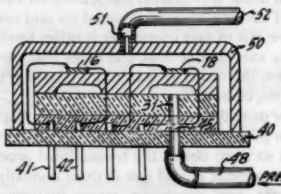
MEDIA COMPATIBLE PRESSURE TRANSDUCER

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Aug. 13, 1979, Ser. No. 65,886

Int. Cl.[3] G01L 9/06

U.S. Cl. 73—721 **17 Claims**



10. An absolute pressure transducer, comprising:

(a) a wafer of a semiconductor material having a top and bottom surface with relatively thin side surfaces, said

bottom surface having first and second circular recesses adjacent one another and relatively of the same diameter manifesting a first and second diaphragm area,

(b) a base plate secured to said bottom surface to cover said recesses with said base plate having an aperture communicating solely with said second circular recess,

(c) a first piezoresistive circuit arrangement mounted on said top surface of said wafer above said first depression with a peripheral sensor located near an edge of said recess and a central sensor located near the center of said recess,

(d) a second piezoresistive circuit arrangement mounted on said top surface of said wafer above said second recess with a peripheral sensor located near an edge of said recess and a central sensor located near the center of said recess,

(e) means for applying a reference pressure to said top surface of said wafer,

(f) means for applying another pressure to said aperture in said base plate for directing the same solely to said second recess, and

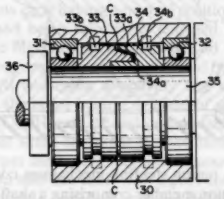
(g) means coupling said piezoresistive sensors in a circuit arrangement to cause said circuit to provide an output indicative of said another pressure as referenced to said reference pressure.

4,222,278

GYRO APPARATUS USING VISCOUS DAMPING DEVICE

Shuji Nakamura, Komae, Japan, assignor to Tokyo Aircraft Instrument Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1978, Ser. No. 894,159
Claims priority, application Japan, Feb. 28, 1978, 53-25263
Int. Cl.[2] G01C *19/16*; B23P *11/00*
U.S. Cl. 74—5.5 **4 Claims**



1. A gyro apparatus using a viscous damping device which rotatably supports a gimbal shaft and in which damping is provided in a rotational direction between the gimbal shaft and a gimbal bearing sleeve supporting said gimbal shaft comprising:

a first ring fixed to the outer periphery of the gimbal shaft and having a circular groove at an axial end thereof,

a second ring fixed to the outer periphery of the gimbal shaft and having a circular protrusion at one end thereof, said protrusion being complementary to said circular groove and of smaller volume than said circular groove,

ball bearings supporting within said sleeve the gimbal shaft to which the first and second rings are fixed when the circular groove and the circular protrusion are completely inserted into each other so as to form an even air gap between the outer peripheries of the first and second rings and the inner wall of the bearing, and

damping liquid filling the air gap between the outer peripheries of the rings and the inner wall of the sleeve thereby providing an even damping force.

4. The method of assembling a viscous damping device to a gimbal shaft surrounded by a gimbal bearing sleeve spaced therefrom, said viscous damping device including a first ring having a circular groove at an axial end thereof and a second ring having a circular protrusion at one end thereof complementary to the circular groove in said first ring and of smaller volume than said circular groove, said method comprising the steps of

filling the circular groove of said first ring with a viscous damping liquid;

placing said first ring on said gimbal shaft with an air gap between said first ring and said sleeve;

placing said second ring on said gimbal shaft with an air gap between said second ring and said sleeve;

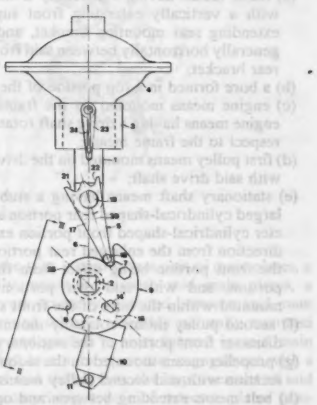
translating said second ring along said gimbal shaft with respect to said first ring to insert the circular protrusion of said second ring into the circular groove of said first ring thereby pushing out said damping liquid from said circular groove into said air gap between the outer peripheries of said first and second rings and the inner wall of said sleeve to provide an even damping force.

4,222,279

TRANSMISSION MECHANISM

Carl G. Hård af Segerstad, Karasgarden, S-795 00 Rätvik, Sweden

Filed Nov. 23, 1977, Ser. No. 854,324
Claims priority, application Sweden, Nov. 30, 1976, 7613392
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—100 R **5 Claims**



1. A transmission mechanism for imparting rotational movements to a driven member about a fixed axis by means of a reciprocating drive member, said mechanism comprising means pivotally connected to said drive member for alternately actuating two dogs of an operating unit associated with said driven member, said dogs being located on opposite sides of a central plane extending through the travel path of the drive member, so as to move said operating unit to one or the other of two end positions thereby providing said rotational movement of the driven member, the improvement that said means for actuating said operating unit is an arm mounted for pivoting to and fro across said central plane and arranged to effectuate said alternate actuation of both the dogs by one and the same free end thereof, and power means located on a side of said fixed axis remote from said drive member and opposing said drive member for moving said operating unit to the respective end positions, said power means being pivotally mounted in relation to a stationary pivot and having a point of action opposed to said pivot, said power means having said point of action following said operating unit when moving between said end positions, said operating unit comprising two spaced-apart interconnected plates having circumferential portions in which said dogs are formed, and said arm comprising a stem which is connected to said drive member and contained between said plates as well as two projections project-

ing in opposite directions from said stem for engaging said dogs.

4,222,280

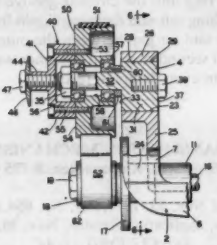
SPEED CHANGING UNIT CONSTRUCTION

Donald M. Stewart, 11420 State Rte. 165, Salem, Ohio 44460

Filed Aug. 21, 1978, Ser. No. 935,530

Int. Cl.[3] F16H *7/10*

U.S. Cl. 474—112 **10 Claims**



1. A speed changing unit construction including:

(a) frame means having a generally U-shaped configuration with a vertically extending front support, a vertically extending rear mounting bracket, and a base extending generally horizontally between said front support and said rear bracket;

(b) a bore formed in a top portion of the front support;

(c) engine means mounted on the frame means, with said engine means having a drive shaft rotatably mounted with respect to the frame means;

(d) first pulley means mounted on the drive shaft for rotation with said drive shaft;

(e) stationary shaft means having a stub shaft with an enlarged cylindrical-shaped rear portion and a smaller diameter cylindrical-shaped front portion extending in an axial direction from the enlarged rear portion, with the axis of the front portion being offset from the axis of the rear portion, and with said rear portion being adjustably mounted within the bore of the front support;

(f) second pulley means rotatably mounted on the smaller diameter front portion of the stationary shaft means;

(g) propeller means mounted on the second pulley means for rotation with said second pulley means; and

(h) belt means extending between and operatively engageable with the first and second pulley means for rotating said pulley means and propeller means by the engine means drive shaft.

4,222,281

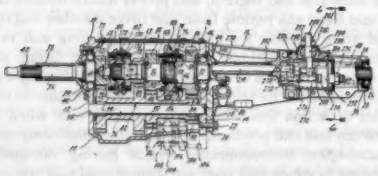
SINGLE SHIFT RAIL MANUAL TRANSMISSION WITH OVERDRIVE SPEED RATIO

Chester Mylenek, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 24, 1978, Ser. No. 889,686

Int. Cl.[2] G05G *5/10, 9/12;* **F16H** *3/38*

U.S. Cl. 74—339 **3 Claims**



1. A multiple speed manual transmission mechanism comprising, an input shaft, an input gear connected to said input shaft, an intermediate shaft disposed coaxially with said input shaft, an overdrive gear journalled on said intermediate shaft, a synchronizer clutch means connected to said intermediate shaft for selectively connecting said input gear and said overdrive gear to said intermediate shaft, a shift rail mounted for shifting movement adapted to cause the transmission to operate in any of its forward or reverse speed ratios, a shift fork engageable with said synchronizer clutch means and mounted for sliding motion on an axis parallel to the axis of said shift-rail, and a pivotally mounted reversing lever engageable with said shift rail and said shift fork whereby said shift fork is moved in one direction upon shifting movement of said shift rail in the opposite direction, thereby causing said synchronizer clutch means to connect either said input gear or said overdrive gear to said intermediate shaft.

4,222,282

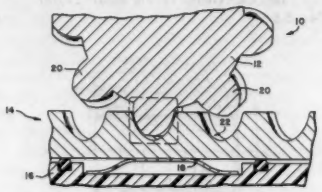
RACK AND PINION TEETH CONFIGURATION

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 24, 1978, Ser. No. 909,142

Int. Cl.[2] F16H *55/08*

U.S. Cl. 74—457 **3 Claims**



1. A rack and pinion steering mechanism comprising:

a rotatable pinion member comprising a shaft for connecting with a steering wheel, the shaft having a plurality of helical teeth extending radially therefrom, each of the teeth defining a pair of substantially circular convex flanks thereon;

a rack member translatable in response to rotation of the pinion member and comprising a plurality of grooves for receiving corresponding teeth, each of the grooves defining a pair of substantially circular concave surfaces thereon, the radius of curvature of the concave surfaces being larger than the radius of curvature of the convex flanks, the pinion and rack members separating slightly in response to rotational torque applied to the pinion member, the rack and pinion members having a partially loaded position wherein the flanks and the surfaces cooperate to create a separating force tending to separate the rack and pinion members in response to rotational torque applied to the pinion member, the members also having a fully loaded position wherein the flanks and the surfaces cooperate to substantially eliminate the separating force;

a housing for movably supporting the rack member; and

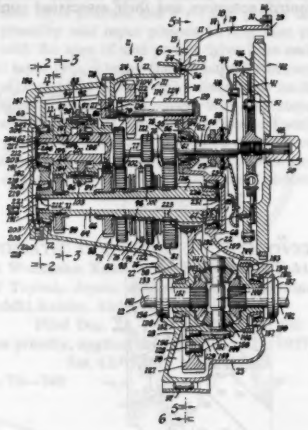
resilient means disposed between the housing and the rack member for allowing slight separation between the rack member and the pinion member from the partially loaded position to the fully loaded position and for biasing the rack member toward the pinion member to resist the separation of the members.

4,222,283

MANUAL TRANSMISSION LUBRICATION SYSTEM

Laszlo Nagy, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1978, Ser. No. 900,732
Int. Cl.[2] F16H 57/04; F01M 9/10
U.S. Cl. 74—467 4 Claims



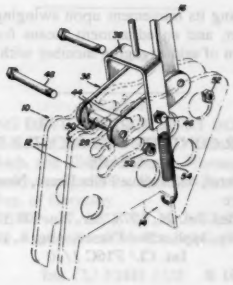
1. In a multispeed ratio transmission: a housing having first and second end walls; input and output shafts supported on said end walls; drive gear means having bearing means, low and high ratio gearsets each having an input gear on said input shaft and an output gear on said output shaft and said low and high ratio gearsets each having a neutral position to disconnect its ratio drive and being selectively engaged to respectively provide low and high ratio drive, one of said gears of one of said gearsets being rotatably mounted by said bearing means on one of said shafts and being selectively free and clutched to said one of said shafts for neutral and one of said ratio drives, and the other of said gears of said one of said gearsets being fixed to the other shaft; an output gearset having a drive gear fixed to said output shaft; centrifugal lubrication means having a through bore in said one shaft with a port connecting to said bearing means on said one shaft and said through bore having first and second open ends; first and second recesses respectively in said first and second end walls facing said first and second open ends; first and second disk springs each respectively having an outer portion secured and sealed to said first and second end walls around said first and second recesses to form first and second chambers, an inner portion spring biased for sealing contact respectively with said first and second open ends around said through bore, and an aperture concentric with and smaller in diameter than said through bore to retain lubricant in said through bore; said housing adapted to contain lubricant to a level above the lower portion of one of said input and output gears of each of said low and high ratio gearsets; first collection means collecting lubricant thrown by said low and high ratio and output gearsets located above said first and second chambers and connected for gravity feed lubricant flow during idle and low speed operation to said first chamber and flow through said aperture in said first disk spring to said through bore for centrifugal pressure lubrication of said bearing means; second collection means collecting lubricant thrown by said high ratio gearset located above said first and second chambers and connected for gravity feed lubricant flow during high speed operation to said second chamber for flow through said aperture in said second disk spring to said through bore for centrifugal pressure lubrication of said bearing means, and first and second ferrules respectively having first and second sleeve portions secured in said first and second open ends of said through bore and first and second annular flanges engaging said first and second open ends of said one shaft around said through bore and being sealed to said one shaft; said first and second disk springs being biased to engage respectively said first and second annular flanges to provide a fluid seal therebetween, and said disk springs and ferrules being made of a thermoplastic resin having resilience to provide a bias force to sealingly engage said flanges of said ferrules and to accommodate for tolerance variation of the position of said first and second open ends of said one shaft, and said ferrules being deformable for securing in said first and second open ends of said through bore and for sealingly engaging said one shaft with accommodation for tolerance variation.

4,222,284

SELECTOR PIN ASSEMBLY FOR MANUAL TRANSMISSION SHIFTER

Ralph R. Bellino, Cleveland; Michael J. Bellino, Parma, both of Ohio, and Robert Thompson, Westchester, Pa., assignors to W. R. Grace & Co., Columbia, Md.

Filed May 15, 1978, Ser. No. 905,669
Int. Cl.[2] G05G 9/08, 9/16
U.S. Cl. 74—473 R 5 Claims



1. In a shifter of the type comprising a pair of main plates, a main lever pivotally mounted between said main plates, a plurality of shift levers pivotally mounted between said main plates, and an improved selector assembly pivotally mounted on said main lever and guided in slots formed in said main plates and in said shift levers for operative engagement with a selected one only of said shift levers, the improvement of said selector assembly comprising a pair of selector plates positioned outwardly of said main plates, a pair of sleeve members positioned between said selector plates one each at the respective ends thereof, a bolt passing through suitable openings in said selector plates and through each said sleeve member, each said bolt being snugly received in each sleeve, and a nut cooperable with each said bolt for securing said selector plates and said sleeve members rigidly together to thereby form said selector assembly, one of said sleeve members comprising the pivotal connection between said selector assembly and said main lever, and the other of said sleeve members comprising the portion of said selector assembly guided in said main plate and shift lever slots to operate said shift levers.

4,222,285

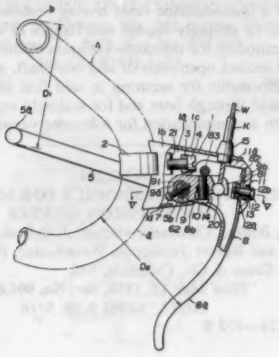
HAND BRAKE CONTROL DEVICE HAVING ADJUSTABLE MAIN AND AUXILIARY LEVERS

Masayoshi Kine, Osaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Oct. 27, 1978, Ser. No. 955,366
Claims priority, application Japan, Nov. 4, 1977, 52-148538
Int. Cl.[2] G05G 11/00; B62K 23/06, 3/02
U.S. Cl. 74—480 R 12 Claims

1. A brake control device for a bicycle comprising, a bracket pivotally supporting a main and auxiliary lever for swinging movement independent of one another, a wire hook supported

within said bracket to move in association with swinging movement of said auxiliary lever, one end of said wire hook being adapted to engage with a brake control wire, an engaging member provided on said main lever for engaging said wire



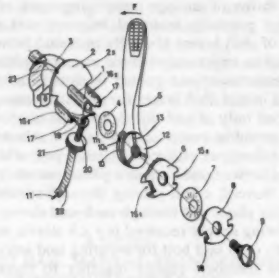
hook and causing its movement upon swinging movement of said main lever, and an adjustment means for adjusting the relative position of said engaging member with respect to said wire hook.

4,222,286

HAND LEVER CONTROL FOR BICYCLE DERAILLEUR GEARS

Roger H. M. Huret, 60, Avenue Félix Faure, Nanterre (Hauts de Seine), France

Filed Jul. 26, 1978, Ser. No. 928,197
Claims priority, application France, Aug. 8, 1977, 77 24378
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 R **6 Claims**



1. Hand lever control for bicycle derailleur gears comprising a lever pivoting on a shaft and against which is applied, through the intermediary of a spring, a co-axial washer cooperating with said lever through ribs and grooves, the hand lever being characterised in that the washer, for its angular positioning, cooperates with play with a fixed stop.

4,222,287

MULTIPLE CONTROL LOCKING DEVICE

Gary A. Drone, and Evsey P. Levin, both of Springfield, Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

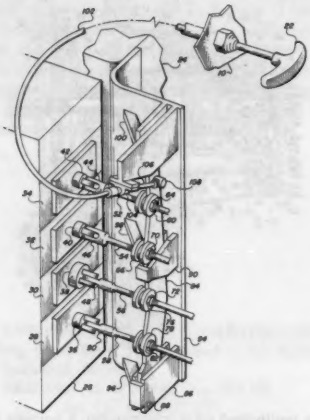
Filed Mar. 27, 1978, Ser. No. 890,251
Int. Cl.[2] G05G *5/06*
U.S. Cl. 74—529 **7 Claims**

1. In combination, one or more control actuators and an apparatus for locking said one or more control actuators, comprising

control rod means associated with each of said one or more control actuators,

said control rod means having circumferential groove means thereon,

support frame means secured in alignment with said one or more control actuators and their associated control rod means,



locking gate means pivotally secured to said support frame means to permit gate movement toward engagement with and away from engagement with said circumferential groove means of said control rod means, and

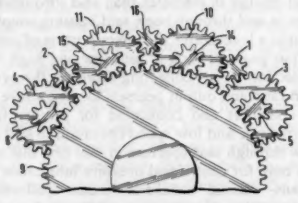
means for selectively moving said locking gate into engagement with and for disengaging said locking gate from said circumferential groove means, whereby said control rods are selectively locked in position and said control actuators thereby inhibited from operation.

4,222,288

SUMMING GEAR ASSEMBLY, PARTICULARLY FOR SHIP DRIVES

Johannes Mange, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 867,943
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700459
Int. Cl.[3] F16H *37/06*
U.S. Cl. 74—665 B **4 Claims**



1. Summing gear assembly for transmitting driving power from a driving machine with separate power outputs, such as a steam turbine unit including a high pressure turbine, an intermediate pressure turbine, and a low pressure turbine, comprising a common power take-off gear, a number of input pinions each connected to a separate power output and a plurality of

power drive lines for transmitting the driving power from said input pinions to said power take-off gear, each said power drive line comprising an axially extending shaft, a stepdown gear mounted on said shaft, and an intermediate pinion mounted on said shaft and spaced axially from said stepdown gear thereon, said shafts of said power drive lines disposed in parallel relation and spaced laterally apart about the periphery of said power take-off gear, wherein the improvement comprises n said input pinions, and n+1 said power drive lines, n being a plurality said input pinions having axes extending in parallel with the axes of said power drive lines and the axis of each said input pinion being spaced laterally between the axes of two adjacent said power drive lines with each said input pinion being in meshed engagement with said stepdown gears on the two adjacent said power drive lines and with said intermediate pinions thereon each in meshed engagement with said power take-off gear and n−1 of said stepdown gears being in meshed engagement with two of said input pinions.

4,222,289

AUTOMATIC TRANSMISSION WITH OVERDRIVE

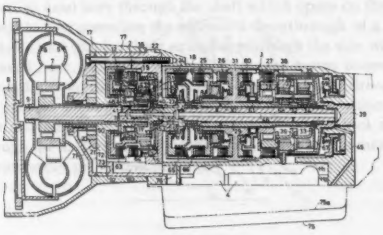
Kazuaki Watanabe; Kouziro Kuramochi, and Yukio Terakura, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichiken, Japan

Filed Dec. 22, 1977, Ser. No. 863,406

Claims priority, application Japan, Apr. 27, 1977, 52-47875

Int. Cl.³ F16H *37/00, 57/02*

U.S. Cl. 74—740 **1 Claim**



1. In an automatic transmission with overdrive for use in automotive vehicles particularly adapted to have parts thereof interchangeably utilized in other transmissions not including overdrive, the combination comprising: a torque converter consisting of a pump impeller, stator vanes, and turbine vanes, and including a turbine shaft for said turbine vanes having an output end; an overdrive gear mechanism having an overdrive input shaft, and a planetary gear unit controlled by a first frictional engaging means coupled to said overdrive input shaft, said overdrive gear mechanism providing a gear reduction ratio of not more than 1; an underdrive gear mechanism having an underdrive input shaft, and a plurality of planetary gear units which are coupled through the medium of a second frictional engaging means to said underdrive input shaft and controlled by said second frictional engaging means and a plurality of other frictional engaging means, said underdrive gear mechanism providing gear reduction rates of not less than 1; said underdrive gear mechanism being structured to be coupled in direct driving engagement with said torque converter in the absence of said overdrive gear mechanism; said torque converter, said overdrive gear mechanism and said underdrive gear mechanism being separably segmented and fastened together by simple fastening means; a torque converter housing, an overdrive case, and a transmission case separately provided for said torque converter, said overdrive gear mechanism and said underdrive gear mechanism, respectively; said overdrive gear mechanism being positioned between said torque converter and said underdrive gear mechanism, with said overdrive input shaft and said output end of said turbine shaft being joined together by a splined connection; said overdrive input shaft and said underdrive input shaft being positioned in axial alignment with each other; a cylindrical extension formed on said torque converter housing with a given inner diameter; said overdrive case being of a cylindrical form and having an outer diameter which is substantially equal to said given inner diameter of said torque converter housing extension; said transmission case also having a cylindrical extension with an inner diameter substantially equal to both said given inner diameter of said torque converter housing extension and said outer diameter of said overdrive case; said overdrive case being fitted in said cylindrical extension of said torque converter housing and in said cylindrical extension of said transmission case, with said torque converter housing, said overdrive case and said transmission case being fastened together by a plurality of bolts extending therethrough; said torque converter and said underdrive gear mechanism being each structured, respectively, of a standardized configuration enabling each to be selected from a plurality of other identical units produced by mass production techniques whereby parts useful in said automatic transmission may also be used in other automatic transmissions not including an overdrive gear mechanism.

4,222,290

SECURING DEVICE FOR PLANET BOLTS IN PLANETARY GEAR CHANGE-SPEED TRANSMISSIONS

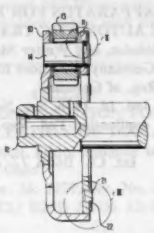
Josef Helmer, Aich, and Jürgen Pickard, Wernau, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,202

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652652

Int. Cl.² F16H *1/28*

U.S. Cl. 74—801 **12 Claims**



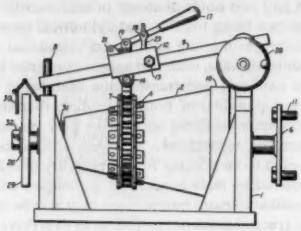
1. A securing arrangement for planet bolt means in planet gear change-speed transmissions, in which planet bolt means are secured in a planet gear carrier means against axial displacement on one side by a common securing means operable to be fixed at the planetary gear carrier means, characterized in that a securing ring means is provided for each planet bolt means, an annular groove is provided in each planet bolt means for accommodating a respective securing ring means, bore means are provided in the planet gear carrier means for respectively accommodating the planet bolt means, each of said bore means are enlarged on a side facing the common securing means into a groove axially open toward the outside, the securing ring means are pressed into the respective annular grooves prior to an insertion of the planet bolt means into the respective bore means, and in that the common securing means is axially mounted over all of the planet bolt means after an insertion of the planet bolt means so as to axially secure all of the planet bolt means against displacement.

4,222,291

CONICAL ROLLER CHAIN INDEXING DEVICE

Patrick J. Murphy, Jr., 12554 Knoll Rd., Elm Grove, Wis. 53122

Filed Jun. 12, 1978, Ser. No. 914,944
Int. Cl.[2] B23B *29/24;* F16H *27/02*
U.S. Cl. 74—813 R 11 Claims



1. In a machine indexing device having a rotatable shaft connected to a part to be indexed, the novelty comprising:

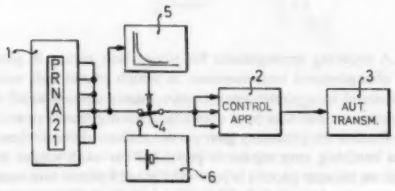
An axially tapered body of rotation fixed to the rotatable shaft for rotation therewith, means for supporting a circle of connected discrete stop elements comprising a selected number of said stop elements on said tapered body of rotation in a plane at right angles to the axis of the shaft and at an axial location on the tapered body of rotation such that the circle of stop elements is taut around the body of rotation, a plurality of said discrete connected stop elements on said support means about said body of rotation, and non-rotatable stop mechanism including stop means engageable with any selected discrete stop element whereby to fix said rotatable shaft against rotation in any one of as many stop positions as there are discrete stop elements.

4,222,292

METHOD AND APPARATUS FOR REDUCING JOLT IN VEHICLE AUTOMATIC TRANSMISSIONS

Gerhard Will, Steinheim, and Walter Stroh, Sachsenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,449
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703009
Int. Cl.[3] B60K *17/12*
U.S. Cl. 74—866 10 Claims



1. An apparatus for reducing gear shifting jolt in a vehicle having a stepwise-operating automatic transmission equipped with a gear-range selection lever for selecting a neutral gear range (N) and at least two drive ranges, magnetic valves for determining the gear in which the transmission operates, a control apparatus for selectively operating the magnetic valves and at least one automatic clutch for establishing and interrupting power transfer between an engine and the transmission, said apparatus for reducing jolt comprising:

a control circuit for connecting said gear selection lever (1) with said control apparatus (2);

a first transfer switch (4) interposed in said control circuit for selectively connecting said control apparatus (2) to said gear-range selection lever (1) or to a first voltage source (6), said transfer switch having a control input, and

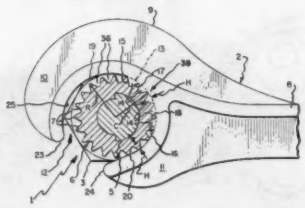
a delay circuit (5) connected between contacts operated by said gear-range selector lever (1) and said control input of said first transfer switch (4) for causing voltage from said first voltage source to be applied to said control apparatus for a predetermined fixed period following movement of said lever out of neutral gear position to a drive range position and thereby causing said control apparatus to impose a higher gear for just the duration of said period.

4,222,293

BI-DIRECTIONAL WRENCH

Kenneth D. Schreyer, Clarence, and Richard A. Borowiec, Grand Island, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,346
Int. Cl.[3] B25B *13/08*
U.S. Cl. 81—90 B 3 Claims



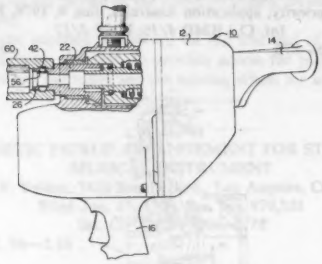
1. A bi-directional wrench (2) for turning a member (6) in either direction without end to end or side to side reversal of the wrench (2), said member (6) having a multiplicity of equally spaced, outwardly projecting teeth (7) around its periphery whereby the cross-sectional profile of said member (6) at the location of said teeth (7) has the appearance of a multi-lobed star, said wrench (2) having an integral handle (8) and head (9) which includes a pair of jaws (10,11) configured to form a concave opening (12), characterized in that said opening (12) is bounded in part by a plurality of wrench teeth (14) projecting from a concave circular base line (13) having a radius of curvature (C) substantially equal to but not less than the radius (R) drawn from the central axis of said cylindrical member (6) to the tip of one of its teeth (7), said wrench teeth (14) being equally spaced and inwardly projecting with planar faces for engaging the faces of the teeth (7) of said member (6); the mutually facing faces (17,18) of the two outermost teeth (15,16) of said wrench (2) being disposed to gradually diverge in the direction of said concave opening (12); said wrench head (9) including first and second member support means (19,20) at opposite sides of said wrench teeth (14) on the circular extension of said base line (13); each support means (19,20) being positioned such that a line (31 or 32) drawn therefrom to the inner root point (21 or 22) of the opposite one of said two outermost teeth (15,16) of said wrench (2) form an angle of less than 90° with the facing face (17 or 18) of said opposite one of said two outermost teeth (15 or 16); said inner root point (21 or 22) being defined as the point at which said facing face (17 or 18) of said opposite one of said two outermost teeth (15 or 16) intersects with said cylindrical surface (13).

4,222,294

FASTENER TOOL SOCKET RETAINING ASSEMBLY

Jacob R. Bippus, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1978, Ser. No. 970,120
Int. Cl.[3] B25B *13/00*
U.S. Cl. 81—177 R 2 Claims



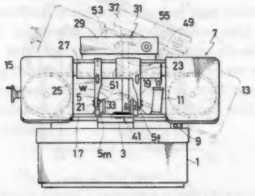
1. A socket driving tool for use in rotatably manipulating a fastener such as a nut or bolt comprising a rotatable shaft with a drive end adapted to have a socket removably secured thereon, the drive end being formed for driving engagement with a complimentary shaped surface of an open-ended drive socket, an axial bore through the shaft which opens on the end surface to accommodate the extension therethrough of a non-rotatable tool shank, a hole extending through the side wall of the axial bore, inwardly depressible detent means projecting outwardly from the hole to retain the socket on the drive end and annular biasing means for said detent means within said bore and adapted to permit the extension of the tool shank through the axial bore while acting to urge the detent means to its outwardly projecting position.

4,222,295

LUBRICATING APPARATUS FOR HORIZONTAL BANDSAW MACHINES

Mitsuyoshi Sawamura, Kobe, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Sep. 29, 1978, Ser. No. 947,047
Claims priority, application Japan, Sep. 29, 1977, 52-129860
Int. Cl.[3] B23D *59/04*
U.S. Cl. 83—169 12 Claims



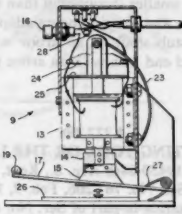
1. A lubricating apparatus for horizontal bandsaw machines which is characterized by: an elongate member having a hollow portion is slidably provided for up and down movement between saw-guide means for guiding a bandsaw blade, said elongate member being provided integrally at its lowermost end with a lubricating member located above a back edge of the bandsaw and also being provided with an elongate plate located at a side of the bandsaw blade, and a plurality of aperture means connected with said hollow portion and provided at an underside of the lubricating member so as to be aligned in a line in a direction along a length of the bandsaw blade.

4,222,296

LEAD CHOPPER

Ronald I. Christy, 26615 Ocean View Dr., and Martin L. Anderson, Box 1034, both of Malibu, Calif. 90265

Filed Jun. 19, 1978, Ser. No. 916,774
Int. Cl.[3] B26D *7/02, 5/08*
U.S. Cl. 83—459 4 Claims



1. A tool for cutting soft ductile material by rapidly accelerating a thin blade through the material to eliminate distortion from cutting, said tool comprising:

a housing;

an upright member to which said housing is attached;

a base connected to said housing and said upright member;

a solenoid mounted to said housing having an armature operatively slidable therein;

a blade holder attached to said armature of said solenoid;

a thin blade attached to said blade holder, the edge of said blade being oriented parallel to said base so as to provide for chopping action;

a pushbutton electrically connected between said solenoid and a source of power, for energizing said solenoid and thereby causing downward acceleration of said armature;

hold-down bar means pivotably connected to said upright member for holding an article to be cut; said hold-down bar means including means defining a finger rest for a workman's fingers and a safety guard for said cutter; and

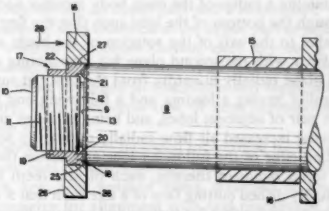
a spring coupled between said housing and said armature for returning said armature when said solenoide is deenergized.

4,222,297

ADAPTER CONSTRUCTION FOR ARBOR INSTALLATION OF TOOLING

Robert T. Jackson, Solon, Ohio, assignor to Northeastern, Incorporated, Canton, Ohio

Filed Mar. 26, 1979, Ser. No. 24,158
Int. Cl.[3] B23D *19/06, 35/00*
U.S. Cl. 83—481 9 Claims



1. A contoured adapter ring, for facilitating arbor installation of disc knife tooling and the like, having integral hub and flange portions; the hub portion having an internally threaded axially extending opening provided at one end with an annular recess; the flange portion projecting radially from the hub portion; an annular ring-like end face formed on the flange

portion extending outward from said recess and lying in a plane normal to the axis of the ring; the flange portion having an outer annular contoured surface formed in part by a plurality of differently angled conical surface portions; said contoured surface terminating in a short cylindrical surface portion extending from the conical surface portions to the corner of the flange portion between the contoured surface and said end face; the conical surface portions having differing diameter characteristics, all smaller throughout than the diameter of the cylindrical portion; and the ring being adapted to be threaded onto a threaded stub shaft of an arbor with tight interface engagement of said end face with an arbor body parallel ring-like end face.

4,222,298

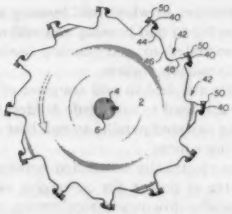
CUTTING TOOL OR THE LIKE

Vaughn F. James, 19430-84th Ave. S., Kent, Wash. 98031

Continuation of Ser. No. 767,206, Feb. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 630,273, Nov. 10, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 949,808

Int. Cl.[3] B23D *57/00*; B27G *13/00*; B26D *1/12*

U.S. Cl. 83—853 **5 Claims**



1. A circular saw blade for use in cutting fibrous material requiring less driving force and generating less heat during operation, comprising:

a generally flat disk-like main body member having a pair of parallel sides and a central bore to receive a driven shaft which causes said blade to rotate about its axis, said disk-like main body portion comprising:

a plurality of radially outwardly extending lobes separate by gullets upon which cutting teeth are mounted,

each of said lobes including a leading edge, facing in the direction of blade rotation, said leading edge having a first flat surface at its outer end to support a tooth and a second flat surface extending generally radially inwardly therefrom, said first flat surface lying in a first plane perpendicular to the sides of the main body at an angle to a second plane perpendicular to the sides of the main body member, containing a radius of the main body member and passing through the bottom of the lobe such that the first plane is parallel to the axis of the rotation of the blade and non-coplanar with the second plane but intersecting said second plane radially inwardly from the first flat surface,

each gullet having a leading and a following end between each pair of adjacent lobes, and being of a size and shape to cause increased air flow radially outwardly across the leading edge of the following lobe and across the face of the tooth mounted thereon, each of said teeth having a conically dished cutting face of a size such that it does not cover the entire first flat surface and rearwardly extending mounting shaft,

each of said teeth mounted toward the outer limits of the leading edge of the lobe within the first flat area and having the cutting face which extends radially outwardly of the first flat surface but leaves the radially inwardmost portion of the flat surface unobstructed, allowing the air to expand as it passes thereby, increasing velocity and assuring constant turbulent, cooling and cleaning airflow past the cutting face of each tooth.

4,222,299

MULTI-BLADED CUTTING APPARATUS

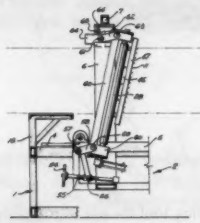
Peter Treffner, and Charles Treffner, both of 43 Yangoora Rd., Belmore, N.S.W. 2192, Australia

Filed Jan. 2, 1979, Ser. No. 529

Claims priority, application Australia, Jan. 9, 1978, PD2980

Int. Cl.[3] B26D *4/16*; B26F *3/12*

U.S. Cl. 83—870 **13 Claims**



1. A cutting apparatus comprising:

two elongate spaced apart cutter supports;

drive means to cause said cutter supports to oscillate 180° out of phase to each other,

a plurality of elongate cutters of which substantially half belong to a first set and the remainder to a second set;

resiliently extensible connector means connecting one end of each cutter of said first set to one cutter support and one end of each cutter of said second set to the other cutter support; and

non-extensible connector means connectng the other end of each cutter of said first set to said other cutter support and said other end of each cutter of said second set to said one cutter support.

4,222,300

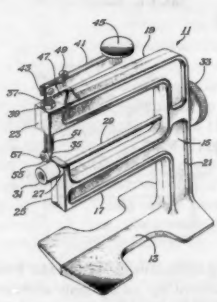
GLASS SCORING APPARATUS

Michel E. El-Habr, 3930 W. Vickery, Fort Worth, Tex.

Filed Apr. 9, 1979, Ser. No. 28,125

Int. Cl.[3] B26D *3/08*

U.S. Cl. 83—886 **8 Claims**



1. An apparatus for scoring glass, comprising:

a frame having a vertical member and upper and lower arms laterally disposed from their vertical member; the upper and lower arms having ends terminating a selected distance from the vertical member;

a resilient roller rotatably mounted to the end of the lower arm;

rotating means mounted to the frame for rotating the roller;

a shaft carried vertically and slidably by the upper arm adjacent its end;

a lever arm pivotally connected to the shaft above the upper arm and having a free end, the upper arm having a fulcrum on its upper surface contacted by the lever arm immediate its ends;

a scoring tool mounted to the shaft below the upper arm and positioned above roller; and

spring means carried by the frame for urging the shaft downward;

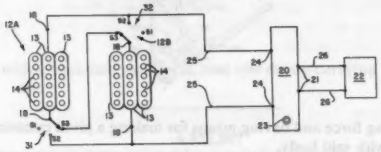
whereby pressing downward on the free end of the lever arm raises the shaft to provide access for placing glass between the roller and the scoring wheel for scoring.

4,222,301

MAGNETIC PICKUP ARRANGEMENT FOR STRINGED MUSICAL INSTRUMENT

Arthur F. Valdez, 7420 Sunset Blvd., Los Angeles, Calif. 90046

Filed Jan. 17, 1978, Ser. No. 870,133
Int. Cl.³ G10H *3/08, 3/18*
U.S. Cl. 84—1.15 **10 Claims**



1. A three-coil magnetic induction type pickup unit for electrical guitars and other stringed musical instruments, comprising:

three similarly constructed substantially oval shaped magnetic pickups disposed side by side abutting each other in a substantially mutually parallel relationship;

each of said three-magnetic pickups having a plurality of similarly disposed separate spaced apart substantially mutually parallel magnetic pole pieces, the number of said pole pieces corresponding to the number of instrument strings with which said pickup unit is to be used and each of said pole pieces being situated spaced apart for positioning adjacent a different one of such instrument strings, each of said three magnetic pickups also having a single common substantially oval shaped coil surrounding said plurality of pole pieces whereby magnetic fields generated in said pole pieces by string movement induce corresponding electrical signals in said common coils;

a pair of coil output terminals; and

means for electrically interconnecting said common coils of said three magnetic pickups between said coil output terminals, said interconnecting means electrically interconnecting said three common coils in phase whereby said in phase connected three common coils operate to produce an enhanced output signal across said pair of coil output terminals.

4,222,302

BOW GUIDE FOR A STRINGED INSTRUMENT

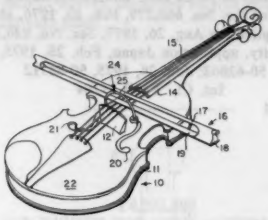
Margherita Sanfilippo, 1188 Westwood Dr., San Jose, Calif. 95125

Filed Aug. 2, 1979, Ser. No. 63,034
Int. Cl.³ G10D *3/16*
U.S. Cl. 84—283 **3 Claims**

1. In combination with a stringed instrument having a top surface with F holes therein and supporting the strings of the instrument which are stroked by a bow, a guide comprising:

a rigid member formed in a U-configuration for extending between the F holes and above the strings of the instrument; and

a plug fixed to each end of the rigid member and sized to fit into the adjacent F hole to support the rigid member on



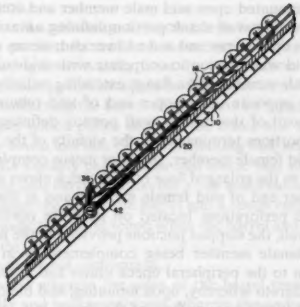
the instrument for guiding the bow as it is drawn across the strings.

4,222,303

MUSICAL JUSTIFICATION FOR GUITARS AND THE LIKE

Dmytro M. Kryzanowsky, 32-85 37th St., Long Island City, N.Y. 11103

Filed Nov. 21, 1978, Ser. No. 961,527
Int. Cl.³ G10D *3/04, 3/08*
U.S. Cl. 84—315 **3 Claims**



1. A justifying device mountable on the fingerboard of a stringed instrument having a plurality of frets, said device comprising:

a housing having an upper part and a lower part;

a plurality of keys mounted in the upper part of said housing for vertical movement therein, each key being movable between an initial position and a depressed position, said keys being arranged in transverse and longitudinal symmetry, each transverse row of keys corresponding to a given fret;

a plurality of tongues mounted for vertical movement in the lower part of said housing, there being one tongue for each key, said tongues being arranged in longitudinal asymmetry for alignment with said plurality of frets;

means for connecting each of said tongues to its corresponding key for vertical movement therewith, whereby when a key is in its depressed position its corresponding tongue presses the confronting string towards the fingerboard;

means for biasing said keys to their initial positions; and

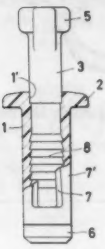
presetting means movably mounted on said housing for selectively depressing a transverse row of keys.

4,222,304

BLIND RIVET

Kosaku Yoshida, Tokyo, and Kunio Hara, Kawasaki, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Continuation of Ser. No. 660,379, Feb. 23, 1976, abandoned.
This application Aug. 26, 1977, Ser. No. 828,223
Claims priority, application Japan, Feb. 25, 1975, 50-25026; May 14, 1975, 50-62802; Jun. 26, 1975, 50-88712
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—71 5 Claims



1. A two-piece blind rivet of plastic material, which comprises a male member having a longitudinally elongated shank, an integrally molded enlarged head at its distal end and an integrally molded head portion at the other end of said shank adapted to be gripped by a pulling tool, the shank of said male member being provided with a series of check claws formed about the periphery of the shank in a series of longitudinally spaced frusto-conical configurations, the enlarged base of said frusto-conical configurations facing the enlarged head a female member mounted upon said male member and comprised of a flexible tubular wall shank portion defining an axial bore and having an open upper end and a lower end, means at the lower end of said wall portion to cooperate with said enlarged head of said male member and a flange extending radially outwardly from the opposite open upper end of said tubular wall, the internal wall of the tubular wall portion defining a series of stepped portions terminating in the vicinity of the open upper end of said female member, shoulder means complementary in diameter to the enlarged base of said check claws adjacent the open upper end of said female member and at least a pair of elongated perforations located on opposite portions of said tubular wall, the stepped portions provided in the internal wall of said female member being complementary in shape and dimension to the peripheral check claws and at least equal in number thereto whereby, upon mounting said blind rivet in an apertured workpiece, pulling of the shank in a longitudinaly direction relative to the associated mounted female member causes the perforated flexible tubular wall of the female member to collapse and expand radially outwardly, causes successive check claws to be snapped into intimate engagement with successive stepped portions in the bore to permit ultimate seating of one of said check claws in said complementary shoulder means to thereby retain said flange and radially expanded portion of the tubular wall in cooperative embracement with opposed work surfaces of the complementary apertured workpiece in which the rivet is adapted to be mounted.

4,222,305

TOOL FOR INSTALLING PRIMERS IN AMMUNITION CARTRIDGES

Richard J. Lee, 3146 Kettle Moraine Rd., Hartford, Wis. 53027

Filed Jan. 8, 1979, Ser. No. 1,494
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—37 13 Claims

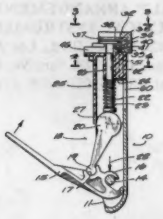
1. A tool for inserting primers in cartridges comprising:

an elongated generally hollow body having a socket at one end into which an apertured cartridge holder is insertable and from which it is removable, said socket having means for limiting longitudinal movement of said holder in at least the direction outwardly from said body,

a carrier member that is insertable in and removable from said body and is constrained to slide longitudinally in said body to engage with said holder and retain it in said socket when said carrier is moved in one direction and to enable removal of said carrier member when it is moved in an opposite direction, said member having a longitudinally extending bore aligned with said holder aperture,

a primer setting pin extending through said bore of said carrier member, said pin having a head, and spring means interposed between said member and the head of the pin to bias said pin in one direction that tends to retract said pin from said holder,

an operating lever having a free end for applying an operating force and having means for making a pivot connection with said body,



a link element pivotally connected at one end to said lever intermediate of said free end and said pivot means of the lever, said link element extending at a first angle relative to said lever into contacting relation with the head of said pin means for preloading said spring and thereby causing said carrier member to be retained in said body and to be biased with a minor force toward engagement with said cartridge holder when said lever is at a first angle corresponding with its unoperated position, said link being projected in a direction to drive said pin through said holder and to increase the load on said spring and the engagement force of said member on said holder when said link is driven to another angle caused by pivoting said lever to an angle corresponding with its operated position.

4,222,306

DECOY-LAUNCHING PACKS FOR FOILING GUIDED WEAPON SYSTEMS

Louis Maury, Toulouse, France, assignor to Societe E. Lacroix, Muret, France

Filed Feb. 28, 1978, Ser. No. 882,197
Claims priority, application France, Mar. 7, 1977, 77 06587
Int. Cl.[2] F41F *1/00*; F42B *4/26, 13/42*
U.S. Cl. 89—1 L 27 Claims

22. A decoy-launching pack for mounting on a directional carriage for foiling or frustrating weapons guidance systems, comprising:

a rigid base suitable for positioning in a predetermined manner on said carriage,

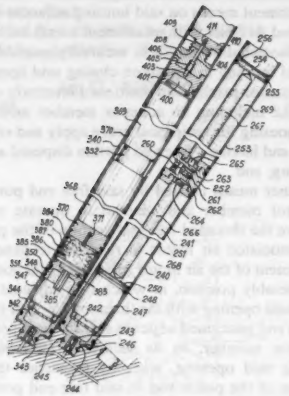
a firing means incorporated with said base for operation in conjunction with a firing-control component integrated in said carriage when said base is located thereupon,

a support located above and secured to said base and having a rack-shaped upper surface defining predetermined angled slopes,

a firing transmission pyrotechnical chain, extending from said firing means to the level of said angled slopes of the upper surface of said support, and wherein said pyrotechnical chain is interlinked and provides a double-firing distribution,

a plurality of mortars with an ejection charge at the bottom bearing upon said angled slopes of said upper surface of

said support, said mortars being predirected in the same plane, according to predetermined angles related to those of said angled slopes of the support surface, and



within each said mortar, at least one decoy-carrying projectile.

4,222,307

ARRANGEMENT FOR TILT-EQUALIZATION OF STEEP ANGLE FIRING WEAPONS

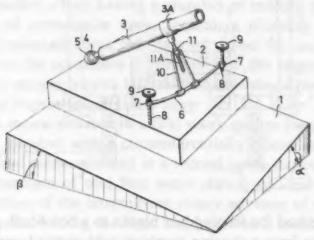
Werner Roettges, Krefeld; Wilfried Becker, and Herbert Lipp, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,114

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2791906

Int. Cl.³ F41F *1/06*

U.S. Cl. 89—37 C **4 Claims**



1. An improved arrangement for equalizing the tilt of steep-angle firing guns, wherein the barrel of the gun is provided at its rear end with a ball pin which is swivelably mounted in a ball socket fixedly secured to a base plate, the improvement comprising,

an at least partially circular segment-shaped leveling guide rail means operatively mounted above said base plate, said ball pin and socket being positioned at the center of said circular segment-shaped leveling guide rail means;

carriage means operatively suporting said gun barrel forwardly of its rear end and being in turn adjustably mounted on said circular segment-shaped leveling guide rail means; and

height adjusting means on said base plate and operatively connected to said leveling guide rail means for adjusting the tilt angle thereof to thereby aid in aiming the steep-angle firing gun;

said carriage means include a slide movably mounted on said guide rail and said height adjusting means include a pair of sleeves spaced from each other and connected to said guide rail means, a pair of spindles adjustably mounted in said pairs of sleeves, the lower ends of said spindles resting on said base plate.

4,222,308

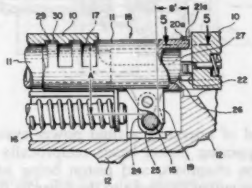
ACCURACY DEVICE FOR SEMI-AUTOMATIC PISTOLS

Perry J. Arnett, 97 S. 100 East, Parowan, Utah 84761

Filed Mar. 26, 1979, Ser. No. 23,582

Int. Cl.³ F41C *5/06*

U.S. Cl. 89—163 **10 Claims**



1. In a semi-automatic pistol of the locked-breech type having,

(a) a frame,

(b) a barrel containing a tenon projecting from the rear upper portion thereof and a contoured under-barrel lug projecting downwardly from the rear portion thereof,

(c) a connecting link attached to the under-barrel lug pivotally connecting the barrel to the frame by means of a slide stop pin which passes through the frame and an aperture in the lower portion of the connecting link and

(d) a slide slidably engaged on said frame said slide encompassing said barrel and having a top undersurface adapted to engage the top of the barrel and a tenon recess adapted to engage the barrel tenon when the barrel and slide are in battery;

the improvement comprising,

(e) a barrel wherein the sides of the barrel tenon taper inwardly and backwardly and wherein the under-barrel lug is contoured with an arcuate contour which represents a portion of a circle having a diameter larger than the diameter of the slide stop pin

(f) a connecting link having an aperture in the lower portion thereof having a diameter slightly larger than the diameter of the slide stop pin

(g) a slide having a tenon recess whose sides are tapered inwardly at the same angle as the sides of the barrel tenon; wherein the tenon recess has a lateral width slightly smaller than the lateral width of the barrel tenon and

(h) means in the slide to fully elevate the barrel during the recoil and loading cycle of the pistol prior to the tenon becoming engaged in the tenon recess wherein, the frame, barrel, connecting link and slide cooperate in such a manner that when in battery the tenon is jam fitted into the walls of the tenon recess in the slide preventing lateral movement of the tenon and the barrel is jam fitted with the upper surface of the barrel engaging the top undersurface of the slide and the contour of the under-barrel lug resting on the slide stop pin in such a manner as to exert an upward and forward force on the barrel preventing vertical movement of the rear portion of the barrel.

4,222,309

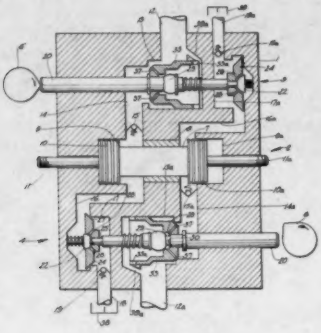
HYDRAULIC POWER SYSTEM

Theodore Ongaro, c/o Ongaro Dynamics, Ltd., 939 King Ave., Columbus, Ohio 43212

Division of Ser. No. 750,562, Sep. 7, 1976, Pat. No. 4,096,784. This application Feb. 2, 1978, Ser. No. 874,371

Int. Cl.[2] F01B *25/02*

U.S. Cl. 91—471 **7 Claims**



1. A method of operating a fluid power system having a piston with opposing piston heads reciprocally mounted in opposing piston chambers, said piston being adapted to be driven from one end of its stroke to the other by fluid pressure, which comprises the steps of establishing a condition in which the piston is at one end of its stroke and each of said piston heads is under positive fluid pressure, a first of the piston heads being under relatively high pressure oriented to maintain the piston at the end of its stroke and the other of said piston heads being under relatively nominal pressure oriented in opposition to the high pressure exerted on the first piston head, and driving the piston to the opposite end of its stroke by first relieving the high pressure on the first of said piston heads to a nominal level and thereafter rapidly increasing the fluid pressure on the other of said piston heads, including the step of maintaining said piston heads under positive fluid pressure at all times by establishing a closed loop hydraulic system having a first side in communication with the piston chamber for said first piston head and a second side in communication with the piston chamber for the other of said piston heads, including the step of maintaining said system filled with fluid at all times.

4,222,310

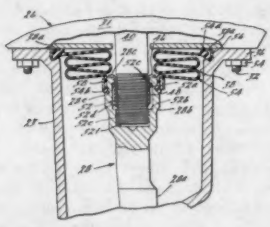
BRAKE ACTUATOR FASTENER ASSEMBLY

Wayne H. Garrett, Troy, and Richard F. Neuman, Farmington, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 4, 1978, Ser. No. 966,345

Int. Cl.[3] F01B *29/00*; F16J *1/10, 15/18*

U.S. Cl. 92—128 **13 Claims**



1. A brake actuator adapted for use with an air motor of the type including a motor casing and a piston rod projecting from said casing and having a threaded free end portion; said actuator comprising:

A. an actuator housing defining an opening providing access to the interior of said housing;

B. attachment means on said housing adjacent said opening adapted to coact with attachment means on the casing of the associated air motor to securedly assemble the casing to said housing in a position closing said opening;

C. an actuator mechanism positioned interiorly of said housing and including an actuator member mounted within said housing for reciprocal brake apply and release movement and having a free end portion disposed adjacent said opening; and

D. fastener means carried by said free end portion of said actuator member and adapted to operate to ratchedly receive the threaded free end portion of the piston rod of the associated air motor in response to generally linear movement of the air motor relative to said housing from a preassembly position, in which it is adjacent but spaced from said opening with the threaded free end portion of its piston rod positioned adjacent said free end portion of said actuator member, to its securedly assembled position closing said opening, whereby to secure the free end portion of the piston rod to said free end portion of said actuator member.

4,222,311

PROCESS AND SYSTEM FOR PRODUCING FOLDED BOXES

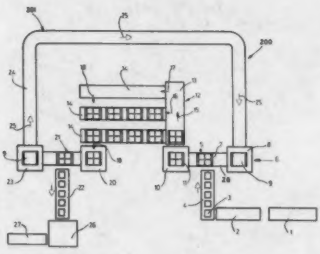
Jean P. Jaton, Chapelle, Switzerland, assignor to J. Bobst & Fils S.A. Lausanne, Switzerland

Filed May 30, 1978, Ser. No. 910,755

Claims priority, application Switzerland, Jun. 3, 1977, 06847/77

Int. Cl.[3] B31B *1/04*

U.S. Cl. 93—36 M **18 Claims**



14. A method for feeding box blanks to a box blank processing machine from a shaping machine, said method comprising providing individual empty pallets from a stack of empty pallets, loading piles of box blanks received from the shaping machine onto the empty pallet to form a loaded pallet, stacking the loaded pallet with a given number of other loaded pallets to form a stack of loaded pallets, conveying the stack of loaded pallets into a storage station, removing a stack of loaded pallets from the storage station and conveying it to an unstacking station for loaded pallets, removing each of the loaded pallets from the stack of loaded pallets at the unstacking station sequentially and transporting each of the loaded pallets to an unloading station, unloading the piles of blanks from the pallets at the unloading station to empty the pallet, transporting each of the unloaded piles of blanks into a preparatory station proceeding the box blanks processing machine, transporting the empty pallet to a stacking station for empty pallets, stacking the empty pallet into a stack of empty pallets of a given number and then transporting the stack of empty pallets to the unstacking station for the empty pallets.

4,222,312

APPARATUS FOR MAKING LINED CONTAINERS

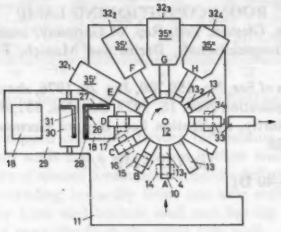
Helmut Wohlfarter, Schleitheim, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Nov. 29, 1978, Ser. No. 964,714

Claims priority, application Switzerland, Nov. 29, 1977, 14590/77

Int. Cl.³ B31B *3/74*

U.S. Cl. 93—40 17 Claims



1. In an apparatus for making a container having an inner bag and an outer stiff box of prismatic shape and rectangular cross section and being formed from a rigid blank having four lateral sides, a large closing flap extending from one end of each side in the same direction, and a small rectangular flap extending from an opposite end of each side in the same direction which is opposite to the direction in which the large closing flaps extend; the apparatus including a rotatably supported mandrel wheel having a plurality of radially extending mandrels of rectangular cross section; a plurality of work stations positioned about the mandrel wheel for sequentially working on the containers introduced into the respective station by the mandrels upon intermittent advance of the mandrel wheel; the improvement comprising

(a) first means situated in a first work station for providing each mandrel with a circumferentially closed inner bag;

(b) second means situated in a second work station, located downstream of said first work station as viewed in the direction of the intermittent rotary advance of said mandrels, for folding the rigid blanks on each mandrel about the inner bag for forming said outer box;

(c) a folding and pressing device situated in a third work station located downstream of said second work station for forming, by folding and pressing, from small rectangular flaps, linear parts of a collar and an inner flange of the outer box; said folding and pressing device including two grippers each having first and second jaws for engaging two oppositely located said small rectangular flaps of the outer box supported on the respective mandrel, first drive means connected to said grippers for cyclically reciprocating said grippers as a unit and second and third drive means connected to said first and second jaws of said grippers for cyclically opening and closing said grippers in unison; each drive means having a driving member and the driving members being independent from one another and running synchronously; and

(d) a stripping means situated in a fourth work station located downstream of said third work station for removing the containers from said mandrels.

4,222,313

MACHINE FOR COUNTING FLAT ARTICLES

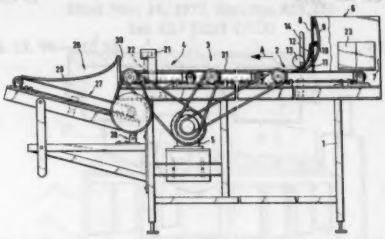
Helmut Staufner, Esslingen-Mettingen, Fed. Rep. of Germany

Division of Ser. No. 705,610, Jul. 15, 1976, Pat. No. 4,142,454. This application Nov. 20, 1978, Ser. No. 962,099

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1975, 2531486; Nov. 11, 1975, 2550590; Apr. 28, 1976, 2618762

Int. Cl.³ B31B *1/94*

U.S. Cl. 93—93 C 4 Claims



1. An improved machine for separating, conveying and counting a plurality of flat bodies such as books, notebooks or sheets of paper, the machine being of the type including separating means for receiving a stack of the flat bodies, conveying means including a conveyor belt having an end portion extending into and forming the bottom of the separating means for successively removing the bottom one of the bodies, the separating means having a holding member extending across the conveying means in spaced relationship therefrom to restrain the stack except for the bottom body therein, wherein the improvement comprises

a first elongated generally band-shaped tension member mounted above said conveying means, one end of said tension member being attached to the side of said holding member facing away from the stack and extending in the direction of conveyance, said tension member being disposed to slide over bodies removed from said stack;

adjustable cam means mounted on a portion of said holding member for adjustably applying pressure to said first tension member, the lower edge of said holding member being spaced above said conveying means by a distance greater than the thickness of a single body, said apparatus further comprising

a second elongated band-shaped tension member having one end attached to the stack side of said holding member near the upper end thereof and extending through the space between said lower edges and said conveying means laterally offset from said first tension member and said cam means such that said second tension member remains free of the influence of said cam means;

a spacing element between said holding member and said second band-shaped tension member below the point of attachment of said second tension member and above said lower edge;

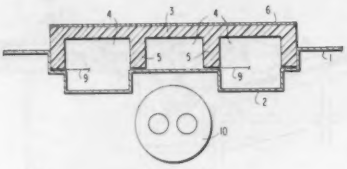
the length of said first and second tension members being greater than the distance of the upper edge of said holding member above said conveying means such that the free end portions of said tension members lie in substantially parallel side-by-side relationship on said conveying means; and

means for counting the bodies as they are conveyed by said conveying means

4,222,314
PASSENGER SPACE VENTILATION SYSTEM FOR MOTOR VEHICLES

Hans Götz, Böblingen; Albert Hack, Sindelfingen, and Hans Winz, Horb, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,052
Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720714
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.
Int. Cl.[3] B60H *1/24*
U.S. Cl. 98—2.18 13 Claims

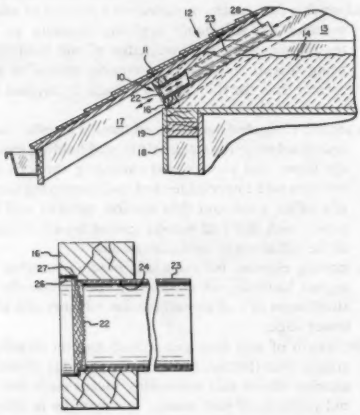


1. A passenger space ventilation system for a motor vehicle which includes a vehicle body and discharge openings provided within a rear area of the vehicle body for discharging stale passenger air from the passenger space to the atmosphere, and means for conducting air from the passenger space past at least one heated vehicle part for cooling the same prior to a discharge of the air through the discharge openings, characterized in that the conducting means includes air guide means arranged at least within an area of the at least one heated vehicle part, the air-guide means is formed on a side thereof facing an interior of the vehicle by at least one molded part, and in that the at least one molded part consists essentially of a heat-insulating material.

4,222,315
VENT BLOCK WITH PRESSED-IN SCREEN

James F. Weirich, Petaluma, Calif., assignor to John P. Dunbar, Larkspur, Calif.

Division of Ser. No. 851,394, Nov. 14, 1977, Pat. No. 4,159,673.
This application May 21, 1979, Ser. No. 40,495
Int. Cl.[3] F24F *7/00*
U.S. Cl. 98—37 3 Claims



2. An attic ventilation installation in a building having a series of parallel roof rafters, comprising:

between each pair of adjacent rafters, an elongate wooden member extending perpendicularly to the rafters, each member having at least one circular bore therethrough, positioned to establish ventilating communication between the attic and the exterior of the building;

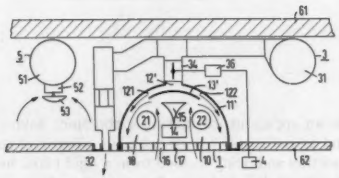
a circular patch of screen pressed into each such circular bore, the screen being of slightly larger original diameter than the portion of the bore into which it is pressed, so that it bows inwardly in a springingly deformed configuration which securely locks it into the bore; and

said bore including a second portion of smaller diameter than said portion into which the screen is pressed, providing an annular stop against which the screen is pressed.

4,222,316
ROOM CONDITIONING LAMP

Jakob Adam, Giessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 650,700, Jan. 20, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,988
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1975, 2502538
Int. Cl.[2] F24F *7/06*
U.S. Cl. 98—40 DL 7 Claims



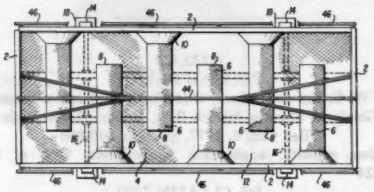
1. A room conditioning apparatus for use with at least one longitudinally extending lamp and with a fresh-air supply, comprising:

a lamp chamber for housing at least one lamp, said lamp chamber being defined by a first wall having longitudinal ends extending parallel to the longitudinally extending lamp and having lateral ends and by second and third walls extending transversely to oppositely disposed longitudinal ends of said first wall and abutting against the lateral ends of said first wall, said first wall extending longitudinally along the length of said lamp when said lamp is housed within said chamber, with only an air space between said first wall and said lamp, said chamber having an open light emission aperture defined by the longitudinal ends of said first wall and by ends of said second and third walls, and at least one exhaust return air opening disposed in one of said second and third walls, for exhausting return air passing from said room into said chamber through said light emission aperture, to a space outside said room; a supply inlet for coupling said supply air to said housing; a nozzle means formed by a baffle plate, spaced from said supply air inlet, and an interior surface of said first wall of said lamp chamber for coupling supply air from said inlet into said chamber along the length of said first wall and for causing said air to be substantially guided along the inside surface of said first wall to one of the longitudinal ends thereof through said chamber, past said lamp and to exit from said chamber through the peripheral portion of said light emission aperture bordered by said one longitudinal end of said first wall, whereby the flow of air along said inside surface will draw additional air from the room through said light emission aperture and past said lamp due to the Coanda effect with a portion of the air flowing through said exhaust return air opening.

4,222,317
METHOD AND APPARATUS FOR FIELD-DRYING HARVESTED CROPS

Joel E. Curtis, Chickasha, and Thornton D. Hall, Fort Cobb, both of Okla., assignors to Gold Kist, Inc., Atlanta, Ga.

Filed Jan. 11, 1979, Ser. No. 2,567
Int. Cl.[3] A01F 25/08
U.S. Cl. 98—56 10 Claims



1. Apparatus for field drying harvested field crops, comprising:

an open-topped container having foraminous opposed side and end walls and a foraminous bottom wall;

a plurality of spaced foraminous conduits defining a first row and extending inwardly from one side wall, spaced upwardly from said bottom wall and having an inner end spaced inwardly from the other side wall;

other plurality of spaced foraminous conduits defining a second row and extending inwardly from said other side wall, spaced upwardly from said bottom wall and having an inner end spaced inwardly from said one side wall;

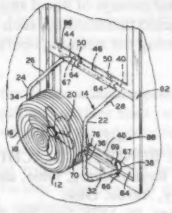
individual conduits of said first row extend and are alternately spaced between said conduits of said second row;

said foraminous walls, bottom wall, conduit being of a porosity to prevent passage of said field crops therethrough while permitting free and substantially unimpeded flow of air therethrough.

4,222,318
COMBINATION WINDOW AND FLOOR FAN

Noel T. Patton; Bennie N. Patton, and Frank M. O'Donnell, all of Fort Wayne, Ind., assignors to Patton Electric Co., Inc., New Haven, Ind.

Filed Dec. 11, 1978, Ser. No. 968,121
Int. Cl.[3] E06B 7/02
U.S. Cl. 98—94 R 32 Claims



1. A portable fan unit comprising:

a frame having a front portion and a rear portion separated by side means connected to and extending between said front and rear portions,

motor driven fan means for producing a stream of moving air, said motor driven fan means being mounted to said frame and spaced rearwardly of said front portion,

said side means being constructed so as to permit air flow therethrough into said stream of air in directions transverse to said stream of air, and

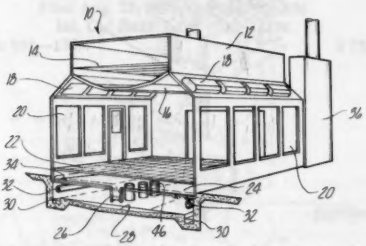
means on said front portion adapted for suspending said frame from means defining a window opening such that said motor driven fan means is spaced from the means defining a window opening whereby air may be drawn into the air stream through said side means,

said means for suspending comprising means on said frame front portion adapted for extending into the window opening and hooking around the means defining a window opening.

4,222,319
PAINT SPRAY BOOTH WITH FLOODED FLOOR

Joseph D. Donahue, Warren, Mich., assignor to Schweitzer Industrial Corporation, Madison Heights, Mich.

Filed Nov. 14, 1977, Ser. No. 851,253
Int. Cl.[2] F23J 11/00
U.S. Cl. 98—115 SB 7 Claims



1. In a paint spray booth of the type comprising an elongate housing defining a working area, a perforate working floor, and means for supplying air to the working area from overhead and for causing a flow of said air downwardly through the working floor:

the improvement comprising a flat sub-floor spaced from and beneath the working floor, means for flooding said flat floor with water to a substantial depth so as to receive and submerge paint deposits from said working floor as well as to receive on the surface of water thereon fine paint overspray from the air, a plurality of longitudinally spaced discrete outlet structures in said sub-floor, said outlet structures having upstanding sidewalls which extend above the surface of said sub-floor to the extent of said substantial depth, and means beneath said sub-floor for receiving and discharging paint-laden water from said outlet structures, said means for receiving comprising a base floor extending longitudinally beneath and laterally of said outlet structures, and disposal sluices at the opposite lateral extremes of said base floor, the combination further comprising hatch means in said sub-floor over said disposal sluices for draining and cleaning said sub-floor.

4,222,320
COFFEE MAKER

Billy J. Castleberry, Lubbock, Tex., assignor to AAA Office Coffee Service, Inc., Lubbock, Tex.

Filed Oct. 27, 1978, Ser. No. 955,343
Int. Cl.[3] A47J 31/10
U.S. Cl. 99—281 3 Claims

1. In a coffee making apparatus having

a. a hot water reservoir containing

(i) a heating coil, and

(ii) at least one thermostat,

b. a pouring tray setting on top the reservoir,

c. a tube extending from the bottom of the tray to near the bottom of the reservoir,

d. a spray head in the bottom of the reservoir,

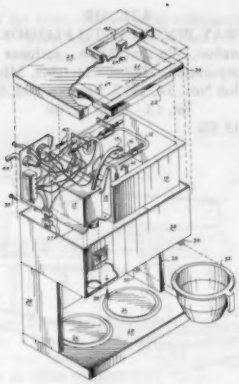
e. a warming plate to receive a carafe, and

f. a housing supporting the reservoir above the warming plate;

the improved structure comprising:

g. a spray tube connected to the spray head,

h. said spray tube extending up into the reservoir to
j. an integral inverted U-shaped top thereof,
k. the opening of the tube below the bight of the inverted U, and
m. the opening being spaced from the remainder of the tube by a distance equal to at least the outer diameter of the tube,
n. all parts of the spray tube being below the bottom of the pouring tray,



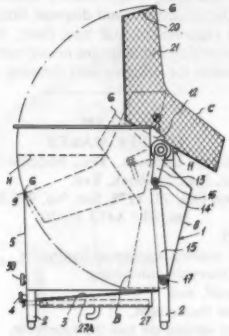
o. rack means on the housing for holding a grounds basket below the spray head,
p. control means for supplying energy to the heating coil responsive to the thermostat,
q. an opening in the housing surrounding said spray head,
r. a chassis with said control means attached thereto,
s. said chassis detachably connected to said housing,
t. said chassis detachably connected to said reservoir, and
u. said reservoir setting unconnected on said housing.

4,222,321

DEVICE FOR THE FLOCCULATION OF ALBUMIN FROM WHEY MATERIAL

Gabriele Muzzarelli, Modena, Italy

Filed Oct. 25, 1978, Ser. No. 954,573
Claims priority, application Italy, Nov. 3, 1977, 22639/77[U]
Int. Cl.³ A01J *11/06*
U.S. Cl. 99—458 **1 Claim**



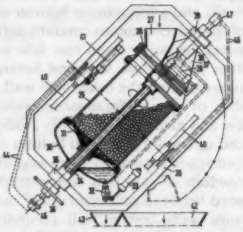
1. A device for the flocculation and collection of whey albumin, comprising a trough or basin having a collecting vessel open at the top and at least one side, which is at least partially permeable to liquids and rotatably carried about a horizontal geometrical axis located at one of the basin walls, and controlled by power means so as to rotate about such an axis from a position adjacent said wall to another position inclined with respect to the horizontal, at which latter position the collected product can be discharged through the open side of the collecting vessel, the basin wall opposite to the wall at which the rotating shaft for the collecting vessel is provided having a cylindrical section, of which the center coincides with the axis of rotation and the radial distance of which from such an axis is such that the edge of the transverse wall will graze it during a portion of the vessel movement.

4,222,322

PEELING DEVICE

Peter W. C. van der Schoot, Ouderkerk, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

Filed Oct. 6, 1977, Ser. No. 840,066
Claims priority, application Netherlands, Oct. 6, 1976, 7611024
Int. Cl.³ A23N *7/00*
U.S. Cl. 99—467 **14 Claims**



1. A peeling apparatus for plants, such as potatoes, carrots, celery, red beets, Swedish turnips, apples and the like, comprising a longitudinally inclined substantially cylindrical peeling vessel having upper and lower end walls, an at least party hollow means for the supply and discharge of a pressure medium and having closable supply and discharge openings in the end walls of the vessel for the plants and condensate, grid means disposed in the vessel and spaced from the lower end wall and a condensing chamber between the grid means and the lower end wall having its end walls formed thereby and receptive of condensate through the grid means and wherein the grid means in conjunction with the inclination of the vessel is configured to permit passage of liquid and to prevent passage of the plants to be peeled therethrough such that they do not lie in the condensate during the steaming operation of the apparatus.

4,222,323

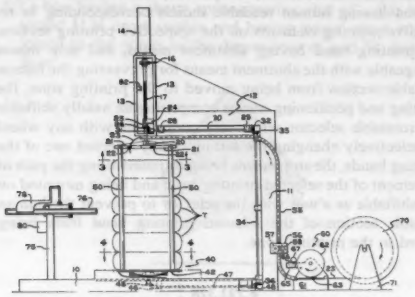
TIRE BUNDLING MACHINE

Troy E. Martindale, Reynoldsburg, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 16, 1979, Ser. No. 30,200
Int. Cl.³ B65B *13/20*
U.S. Cl. 100—12 **10 Claims**

1. In an automotive tire bundling machine having a support framework, a pair of spaced rotatable tire support members journaled on said support framework for rotation, means for selectively moving one of said support members toward and away from the other one of said support members to compress a stack of tires therebetween, a strap feeding means for feeding a strap downwardly through a stack of tires held between said spaced tire support members, guide means mounted on said other one of said support members for aligning tires stacked on said last mentioned support member, and clinching means

mounted adjacent to said support members for engaging a strap that encompasses said stacked tires for drawing and



maintaining the peripheral area of adjacent tires in abutting contact.

4,222,324

APPARATUS FOR DETERMINING THE PRESSURE FORCES EFFECTIVE IN A ROLLING MILL HAVING AT LEAST ONE CONTROLLED DEFLECTION ROLL AND AT LEAST ONE COUNTER ROLL

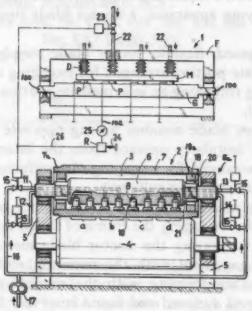
Mario Biondetti, Schio, Italy, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Apr. 30, 1979, Ser. No. 34,499

Claims priority, application Switzerland, May 22, 1978, 5545/78

Int. Cl.³ B30B *15/14, 3/04*

U.S. Cl. 100—47 **7 Claims**



1. An apparatus for determining the pressure forces effective in a rolling mill equipped with at least one controlled deflection roll and at least one coacting counter roll, wherein said controlled deflection roll comprises a roll support, a roll shell rotatable about said roll support, and actuatable hydrostatic support elements located between said roll support and said rotatable roll shell, comprising:

an elastic shell beam having a form and stiffness which essentially corresponds in a predetermined degree to the course and the magnitude of the stiffness of the roll shell of the controlled deflection roll;

a counter beam having a form and stiffness which essentially corresponds in a predetermined degree to the course and the magnitude of the stiffness of the counter roll;

pressure elements acting upon the shell beam which corresponds to the roll shell;

said pressure elements of said shell beam having a position substantially corresponding to the position of at least predetermined ones of said hydrostatic support elements of said controlled deflection roll and effective for exerting forces at the shell beam which correspond to the forces exerted by the hydrostatic support elements of the controlled deflection roll;

pressure measuring elements arranged between both of said beams; and

said pressure measuring elements serving for producing measuring signals which essentially correspond to the forces acting at said pressure measuring elements.

4,222,325

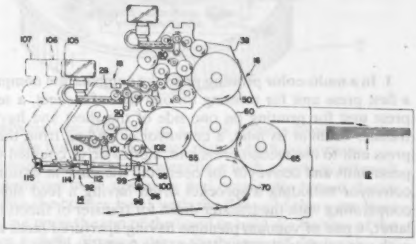
MOUNTING MEANS FOR MOVABLE CARRIAGE ON AN OFFSET PRESS

Robert Edwards, Dudley, Mass., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 25, 1978, Ser. No. 936,826

Int. Cl.³ B41F *7/08, 7/40, 31/34*

U.S. Cl. 101—137 **2 Claims**



1. An offset printing press comprising:

a mainframe including paper handling means, the paper handling means defining a paper handling path extending between a paper feed input and a paper delivery output;

a printer head mounted on and fixed to the mainframe and engageable with the paper handling path at a location generally intermediate the paper feed input and the paper delivery output, the printer head including a single blanket cylinder and a pair of plate cylinders, the plate cylinders being simultaneously engageable with the blanket cylinder, the plate cylinders and blanket cylinder being adjacent to each other and rotatably mounted on the printer head along generally parallel axes, the blanket cylinder being adapted to simultaneously transfer images from the plate cylinders to paper provided by the paper handling means;

a movable carriage mounted on the mainframe and located generally adjacent to the printer head, the carriage being substantially linearly movable along a generally straight line to and from the printer head, the carriage having a rectangular base including four linear motion ball bushings and located at a respective one of the four corners of the rectangular base, the mainframe including a pair of parallel rails upon which the ball bushings ride, the ball bushings engaging the rails to substantially eliminate carriage movement in directions generally perpendicular to the straight line along which the carriage moves, the carriage being positively lockable at predetermined positions along the generally straight line of linear movement;

a first set of dampening and inking rollers rotatably mounted on and fixed to the printer head and engageable with one of the plate cylinders; and

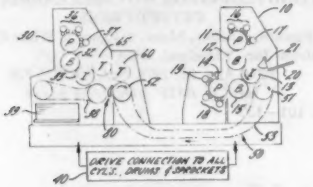
a second set of dampening and inking rollers rotatably mounted on and fixed to the carriage and engageable with the other of the plate cylinders when the carriage is moved toward the printer head to an engagement position.

4,222,326

MECHANISM FOR CONTROLLING AND SMOOTHING A CONVEYED SHEET IN A MULTI-COLOR PRINTING PRESS PARTICULARLY APPLICABLE TO PRINTING IN THE VERSO MODE

Josef Mathes, Offenbach am Main, and Rudolf Melzer, Hainburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1979, Ser. No. 15,640
Int. Cl.[3] B41F 5/16
U.S. Cl. 101—183 11 Claims



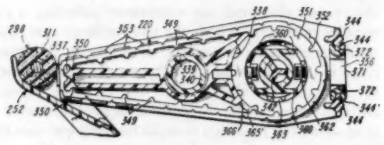
1. In a multi-color printing press the combination comprising a first press unit for printing on one side of a sheet, a second press unit for printing on one side of the sheet and having a transfer drum at its inlet, a conveyor extending from the first press unit to the second press unit, a press drive coupled to the press units and conveyor for operating the same in unison, the conveyor including a sprocket drum having a feed side and cooperating with the transfer drum for transfer of sheets to the latter, a pair of vacuum plenums having apertured faces alined with one another closely adjacent the feed side of the sprocket drum parallel to the axis thereof and spanning substantially the width of a sheet, the apertured faces including apertures in remote axial end portions thereof, the plenums being connected to a source of vacuum and being substantially mirror images of one another, and means coupled to the press drive and timed with the arrival of a sheet for axially spreading the plenums mutually outwardly during passage of the sheet thereby so that the faces of the plenums progressively wipe away any longitudinally extending as well as laterally extending wrinkles in the sheet as the sheet becomes progressively supported on the sprocket drum for sequential passage of the sheet in smooth condition and in accurate register via the sprocket and transfer drums.

4,222,327

LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 29, 1976, Ser. No. 653,405
Int. Cl.[3] B41F 1/08
U.S. Cl. 101—288 1 Claim



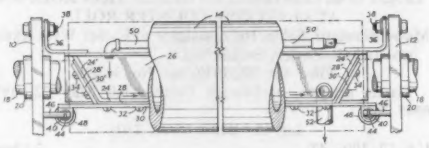
1. Printing apparatus having inking means, comprising: a plurality of rotatably mounted axially aligned wheels rotatable through 360 degrees, a support, a plurality of printing bands each including a printing section and a human readable section, the printing bands being trained about the support and having lugs engaged with the respective wheel, each printing section having a plurality of different printing elements, means for selectively rotating any wheel and positioning any selected printing element at a printing zone adjacent the support to enable selected indicia to be printed, each human readable section having human readable indicia corresponding to respective printing elements on the respective printing section, the printing band having abutment means, and stop means engageable with the abutment means for preventing the human readable section from being moved to the printing zone, the rotating and positioning means comprising an axially shiftable and rotatable selector selectively cooperable with any wheel for selectively changing the setting of any selected one of the printing bands, the stop means being disposed along the path of movement of the selected printing band and being mounted on and shiftable as a unit with the selector to prevent the human readable section of the selected printing band from being moved to the printing zone.

4,222,328

DOCTOR BLADE LIQUID APPLICATOR FOR METERING ROLLS

Walter V. Doyle, Trinity, N.C., assignor to Flex-O-Line Division of Kenton Machine Works, Portland, Oreg.

Filed Jul. 21, 1978, Ser. No. 926,725
Int. Cl.[2] B41L 27/06, 27/08; B41F 31/04, 31/06
U.S. Cl. 101—350 16 Claims



1. For use with a liquid metering roll mounted on the frame of liquid applying apparatus, a doctor blade liquid applicator comprising:

(a) an elongated, flexible doctor blade member having an intermediate portion arranged for engaging the surface of a metering roll along an intermediate portion of the length of the roll,

(b) the doctor blade member having opposite end portions extending angularly upward from the intermediate portion and arranged for engaging circumferential end portions of the metering roll, and

(c) mounting means connected to the doctor blade member arranged for engaging the frame of liquid applying apparatus for supporting the doctor blade member in liquid sealing engagement with the metering roll, the doctor blade member forming with the mounting means and metering roll a closed end liquid reservoir for supplying liquid to the metering roll, the intermediate portion of the doctor blade member forming the bottom of the reservoir, the end portions of the doctor blade member forming the closed ends of the reservoir, the mounting means forming the back of the reservoir and the metering roll forming the front of the reservoir.

4,222,329

UNDERWATER CUTTING DEVICE

Carl F. Austin, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

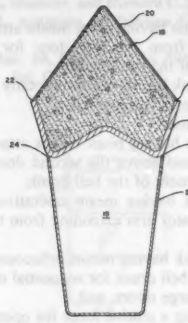
Continuation-in-part of Ser. No. 184,967, Sep. 24, 1971, abandoned. This application Jul. 16, 1973, Ser. No. 380,639
Int. Cl.[3] F42B 1/02
U.S. Cl. 102—24 HC 1 Claim

1. A linear underwater cutting device having a uniform cross section at right angles to its linear axis comprising:

(a) a metallic liner which is W shaped in cross section having outer upper edges and depressions;

(b) a hood member having a shape approximating that of an inverted V in cross section and having outer edges joined to the outer upper edges of said W shaped liner;

(c) a box having a shape approximating that of a flat bottomed U in cross section and having upper outer edges joined to the points of the depressions of said W shaped liner;



(d) a linear shaped explosive charge confined in and substantially filling the space between said W shaped linear and said hood member; and

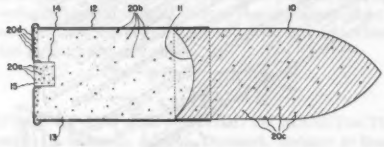
(e) means for attaching a detonating device to said underwater cutting device.

4,222,330

MAGNETICALLY TAGGING AMMUNITION CARTRIDGES

Casimir W. Krystyniak, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,166
Int. Cl.[3] F42B *5/02*
U.S. Cl. 102—38 R **17 Claims**



1. In an improved ammunition cartridge of a type wherein a casing, with one open end, contains an explosive material, said casing being closed by the insertion in said open end, of a projectile, the improvement comprising:

magnetic particles disposed within said cartridge, said magnetic particles exhibiting at least one Curie temperature, whereby the cartridge may be identified by a tag code determined by the Curie temperatures exhibited.

4,222,331

RESILIENT CENTER PLATE ASSEMBLY

Paul E. Gage, Wyomissing, and Richard O. Church, Reading, both of Pa., assignors to The Polymer Corporation, Reading, Pa.

Filed Nov. 6, 1978, Ser. No. 958,125
Int. Cl.[3] B61F *5/16, 5/50*; F16C *17/04, 33/74*
U.S. Cl. 105—199 C **3 Claims**

1. A center plate assembly for permitting relative rotational movement about a vertical axis between a truck and car body including:

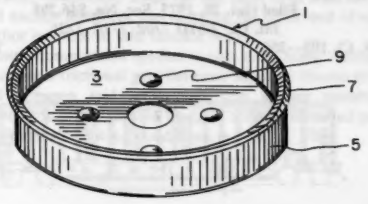
a truck bolster upon which is mounted an upturned horizontally disposed center plate bowl having an inner diameter;

a body bolster from which depends a horizontally disposed center plate having an outer diameter that is seated for rotation within the center plate bowl; and

a bowl-shaped wear liner disposed between facing bottom and sidewall surfaces of the center plate bowl and the center plate;

characterized in that inside and outside sidewall surfaces of the liner terminates in an outwardly and upwardly turned flange which is held between the bowl and the center plate with a discrete annular portion of the outside surface of the flange seated against the inner diameter of the center plate bowl and a discrete annular portion of the inside surface of the flange seated against the outer diameter of the center plate.

3. A method for assembling a wear liner in sealing engagement between the sidewall of a truck bolster bowl and the sidewall of a body bolster center plate which comprises:



positioning a bowl-shaped wear liner with a vertical sidewall terminating in an upwardly and outwardly turned flange within the bolster bowl with the flange of the wear liner resting upon the rim of the bowl to hold the bottom of the liner a slight distance above the bottom of the bowl;

positioning the center plate over the liner;

lowering the center plate into the liner to force the liner to seat in the bottom of the bowl;

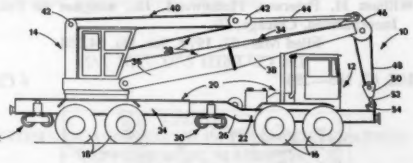
whereby a discrete portion of the inside surface of the flange of the liner is deformed into intimate contact with the sidewall of the center plate and a discrete portion of the outside surface of the flange of the liner is deformed into intimate contact with the sidewall of the bowl.

4,222,332

TRUCK MOUNTED RAILROAD CRANE MAIN BED FRAME

Timothy L. Newman, 700 N. Liberty, Jerseyville, Ill. 62050

Filed Jun. 1, 1978, Ser. No. 911,597
Int. Cl.[2] B60F *1/04*
U.S. Cl. 105—215 C **4 Claims**



1. A main bed frame for a truck mounted railroad crane comprising an upper main bearing plate upon which the crane is mounted, and having wheel means underlying the main bed frame, an inner supporting frame section separating a pair of outer supporting frame sections, all of which underlie and support the upper main bearing plate for substantially the entire length thereof, the inner supporting frame section having a plurality of vertically disposed brace plates supported by a lower frame bearing plate, the pair of outer supporting frame sections each having a rectangular cross section configuration with inner and outer vertically disposed side walls, which extend normal to the vertically disposed brace plates, the inner

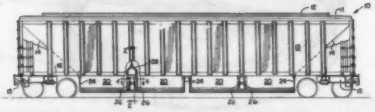
vertically disposed side walls of the outer supporting frame sections being in engagement with the vertically disposed brace plates of the inner supporting frame section, and a plurality of vertically disposed brace elements extending normal to and between the inner and outer vertically disposed side walls of the outer supporting frame sections, the vertically disposed brace elements of the outer supporting frame sections have a length greater than the vertically disposed brace plates of the inner supporting frame section.

4,222,333

RAILWAY HOPPER CAR CLOSURE ACTUATING MECHANISM

James J. Schuller, Crete, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 28, 1977, Ser. No. 846,295
Int. Cl.[2] B61D *7/02, 7/18, 7/26*
U.S. Cl. 105—250 **7 Claims**



1. In a railway car having a hopper with an opening for discharge of lading and oppositely swinging doors forming a generally horizontal floor of said hopper in the closed position supported by hanger means mounted on generally parallel axes, operating means for moving said doors between closed and open positions relative to said opening comprising:

a rotatable shaft extending transversely of said axes and fixedly mounted on the railway car,

a linkage mechanism for each door rotatably mounted on said shaft,

thread drive means on said shaft and on each of said mechanisms for moving the mechanisms lengthwise of the shaft attendant to rotation thereof, and

connector link means operatively connected between the hanger means of the respective doors and each of said mechanisms,

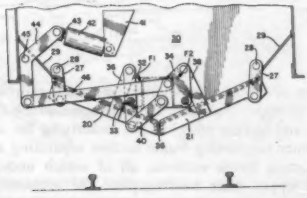
said link means being disposed in alignment with a generally horizontal radial plane of said shaft in the closed position of said doors whereby bending movements upon the shaft are reduced in said position.

4,222,334

HOPPER DISCHARGE DOOR OPERATING MECHANISM

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 27, 1979, Ser. No. 24,338
Int. Cl.[2] B61D *7/02, 7/18, 7/26*
U.S. Cl. 105—250 **6 Claims**



1. A door operating mechanism for railway hopper cars having longitudinally disposed discharge openings, the improvement comprising:

first and second discharge doors having inner ends and outer ends and being arranged to move between a closed position with the inner ends adjacent to an open position for material discharge;

hinge link means attached at each outer end and having means connected with the door and with the car for supporting said door;

first and second operator arms extending from said first and second discharge doors;

a rotating link;

said rotating link having pivot means attached to the hopper car spaced from the first door for pivotal, rotational movement of the rotating link;

said rotating link having means pivotally attached to the first operator arm of the first door;

bell crank means;

said bell crank having pivot means attached to the hopper car and spaced above the second door for pivotal, rotational movement of the bell crank;

said bell crank having means operatively attached to the second operator arm extending from the second door;

a floating link;

said floating link having means interconnecting the rotating link and the bell crank for sequential opening and closing of the discharge doors; and

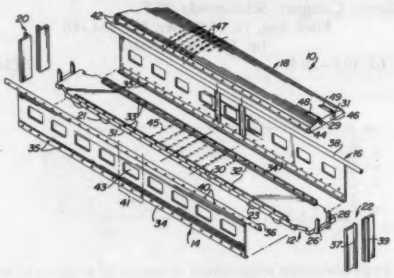
means providing a motive force for operating said doors.

4,222,335

MEANS FOR MANUFACTURING A MODULAR RAILWAY CAR

James C. McQueston, Warminster, and Horace P. Bauer, Huntingdon Valley, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Aug. 22, 1978, Ser. No. 935,769
Int. Cl.[2] B23P *17/00*
U.S. Cl. 105—397 **5 Claims**



1. Modular railway car components adapted to be built in different lengths comprising:

a pair of sideframes built in integral sections having a plurality of uniformly spaced windows with the spacing between windows corresponding to the length of one of said sections, side sills along the lower edge of the sideframe extending the entire length of the sideframe and top rails along the upper edge of each sideframe extending beyond the ends of the sideframes,

a floor having a plurality of uniformly spaced transverse floor beams with the distance between a predetermined number of floor beams corresponding to the length of said one section, and floor sills extending the entire length of said floor adapted to cooperate with said sideframe side sills,

a roof having a plurality of uniformly spaced transverse roof beams with the distance between a predetermined number of said roof beams corresponding to the length of said one section, and roof rails along each side of said roof extending the entire length of said roof and adapted to cooperate with said top rails,

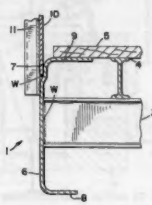
a pair of end frame assemblies, and means for connecting said side frames and end frame assemblies to said floor and said roof to said side frames and said end frame assemblies.

4,222,336

SIDE SILL ASSEMBLY

George L. Rousseau, Munster, and Richard C. Snyder, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 10, 1978, Ser. No. 894,976
Int. Cl.[2] B61D 17/00
U.S. Cl. 105—418 10 Claims



1. In a railway box car having vertical side walls carried by a pair of longitudinally extending side sills and having a plurality of longitudinally spaced crossties extending therebetween supporting the car floor, an improved side sill and wall construction, comprising:

a side sill longitudinally coextensive with a respective side wall of the car and including upper and lower vertical web portions,

said respective side wall having a vertical side sheet and a plurality of longitudinally spaced vertically extending side posts, each post having a flat inner attachment surface throughout its length and a lower end portion outwardly overlying and secured to said lower vertical web portion,

said upper vertical web portion being inwardly offset from the vertical plane of said lower web portion a distance substantially the thickness of said side sheet, and

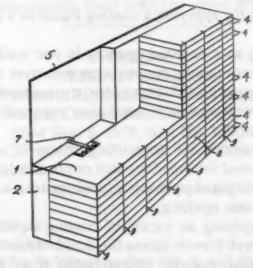
said side sheet being nestled between the posts and the upper web portion and secured thereto in said vertical plane in a manner such that the side sill will carry the load transmitted through the side sheet.

4,222,337

FURNACE LINING AND METHOD OF MANUFACTURE

Jorgen B. Christiansen, Jystrup, Denmark, assignor to Isomax, Ingenior- OG Handelsaktieselskab, Jystrup, Denmark

Filed Apr. 12, 1978, Ser. No. 895,712
Claims priority, application Denmark, Apr. 14, 1977, 1653/77; May 20, 1977, 2207/77
Int. Cl.[3] F23M 5/00
U.S. Cl. 110—336 14 Claims



1. a method of lining the interior surface of a furnace wall with a lining of one or more layers of fiber insulation, including a primary layer adjacent to and exposed to the interior of said furnace, said method comprising the steps of

stacking a plurality of flat, elastically compressible fibrous strips in a row parallel to said furnace wall with the flat faces of said strips making flush abutment with each other and extending in planes transverse to the plane of said furnace wall,

applying elastic compression to groups of said strips in said row in a direction to decrease the height of each of said groups,

providing a plurality of elongated linear anchor members each having at one end a flat face having a width substantially less than the width of said strips,

placing upon the uppermost strip of each of said groups of stacked, compressed strips the flat faces of at least one of said anchor members, and securing the other end of each anchor member to said furnace wall,

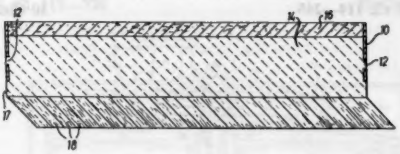
the elastic compression applied to said strips being sufficient to create a frictional grip between adjacent fibrous strips and between said strips and said anchor members, whereby to maintain said lining in a stable mounted position during servicing conditions.

4,222,338

LININGS FOR FURNACES

Albert E. Adams, Stoke-on-Trent, England, assignor to Combustion Linings Limited, Staffordshire, England

Filed Oct. 16, 1978, Ser. No. 951,992
Claims priority, application United Kingdom, Oct. 18, 1977, 43220/77
Int. Cl.[3] F23M 5/00
U.S. Cl. 110—336 25 Claims



1. A furnace lining comprising ceramic fibres the fibre orientation lying at an acute angle to the furnace wall to be lined such that the surface of the lining exposed to the furnace interior is formed substantially by fibre ends.

4,222,339

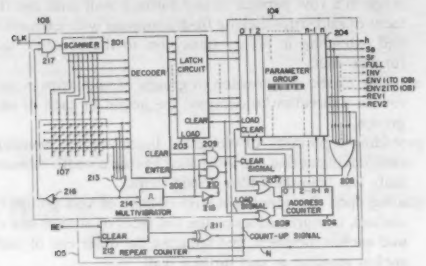
AUTOMATIC COMPOUND PATTERN GENERATION TYPE SEWING MACHINE

Akinobu Iwako, Tokyo, Japan, assignor to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan

Filed Oct. 11, 1978, Ser. No. 950,374
Claims priority, application Japan, Feb. 28, 1978, 53-23839
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 E 3 Claims

1. In an automatic pattern generation type sewing machine, a digital signal generating device including function generation means for calculating stitch positions in accordance with a function and selected input parameters and means for outputting digital signals corresponding to the calculated stitch positions, said function generation means being operable in accordance with signals synchronous with the rotation of the arm

shaft of the sewing machine, and means for successively applying different sets of parameters to said digital signal generating



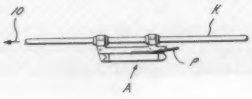
device to vary the stitch positions calculated in accordance with the function.

4,222,340

CABLE DEPTH CONTROL APPARATUS

Jimmy R. Cole, Houston, Tex., assignor to Syntron, Inc., Houston, Tex.

Filed Nov. 1, 1978, Ser. No. 956,731
Int. Cl.[2] B63G *8/00*; B63B *21/00*
U.S. Cl. 114—245 **10 Claims**



1. A depth control apparatus for a seismic cable or the like, comprising:

(a) spring means for exerting a force corresponding to that of water pressure at a desired operating depth for the cable;

(b) piston means responding to ambient water pressure for exerting a force against said spring means;

(c) a control body member for enclosing said spring means and said piston means, said control body member being mounted to said cable at a spaced position therefrom;

(d) diving plane means for causing said apparatus and the cable to move to the desired operating depth;

(e) moment arm means interconnecting said piston means and said diving plane means;

(f) front and aft spring insert means mounted in said control body member for exerting a force on said spring means;

(g) an adjusting screw mounted with said front spring insert means in said control body member for adjusting the relative position of said front spring insert means with respect to said rear insert means to control the amount of force on said spring means; and

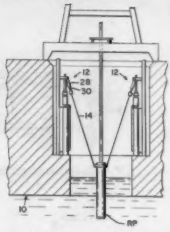
(h) a plurality of guide rods mounted in said control body member for restraining said front spring insert means against relative rotational movement during adjusting of the position thereof by said adjusting screw.

4,222,341

RISER TENSIONING WAVE AND TIDE COMPENSATING SYSTEM FOR A FLOATING PLATFORM

Charles H. Larsen, Everett, and Cornelis J. Heeres, Seattle, both of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Jan. 11, 1978, Ser. No. 868,670
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—264 **7 Claims**



1. A floating platform, a riser pipe suspended from said platform, a riser tensioner for tensioning said riser pipe, comprising:

an hydraulic actuator cylinder having an extendible hollow first rod;

a second hydraulic actuator having an extendible second rod telescopically mounted within second rod telescopically mounted within said extendible hollow first rod;

track means external of said cylinder for guiding and supporting the outer end of said second rod,

means coupling the outer end of said second rod to said riser pipe,

first control means for providing an adjustable constant load on said second rod for compensating for wave action on the platform, and

second control means for providing an adjustable constant force on said first rod for locating the first rod relative to the platform whereby the position of the second rod is adjusted by the position of the first rod for compensating for tide, platform offset or other less frequently changing distance variables.

4,222,342

APPARATUS FOR COATING A MOVING WEB

Gunnar Johansson, and Mats O. Kullander, both of Säffle, Sweden, assignors to Billeruds Aktiebolag, Säffle, Sweden

Filed Feb. 6, 1978, Ser. No. 875,313
Claims priority, application Sweden, Feb. 14, 1977, 77015881
Int. Cl.[3] B05C *3/18, 11/04*
U.S. Cl. 118—50 **15 Claims**

1. Apparatus for applying a coating liquid to a moving web, comprising;

a box having an elongated opening in one wall thereof;

means for continuously conveying a web over said opening;

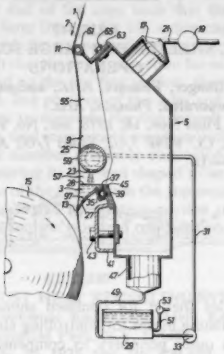
means for creating a sub-atmospheric pressure in said box to press the web against at least two opposed edges of the opening;

a support member for supporting the web, said member being disposed intermediate said opposed edges and dividing said elongated opening into an upstream opening and a downstream opening;

means for applying an excess of coating liquid to the web while the web travels across the downstream opening; and

means for removing the excess liquid from the web and defining the downstream one of said two opposed edges, the width of the upstream opening, measured in the direction of travel of the web, being considerably greater than

that of the downstream opening, so as to create a tension in the web traveling over said upstream opening, to



thereby eliminate unstretched areas in the web before the coating liquid is applied to the web.

4,222,343

COATING APPARATUS

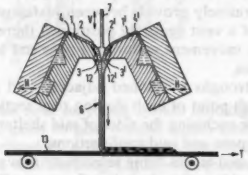
Anton Zimmermann, Montagny-la-Ville, and Roland Haenni, Giffers, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 7, 1978, Ser. No. 940,408

Claims priority, application Switzerland, Sep. 12, 1977, 11116/77

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—325 **7 Claims**



1. Coating apparatus comprising oppositely disposed slideways sloping downwardly to form a gap, each slideway including a slot through which liquid is discharged to flow down the associated slideway and an edge over which the liquid flows through said gap, the edges being positioned at substantially the same level; and an intermediate element positioned in said gap to divide it into component gaps and having sides converging symmetrically about a vertical axis and terminating at an edge substantially level with the edges of said slideways.

4,222,344

SIZE APPLICATOR

Kantilal R. Parbhoo, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 5, 1978, Ser. No. 939,518

Int. Cl.² B05C *11/00, 1/00, 1/06;* **C03C** *25/02*

U.S. Cl. 118—608 **11 Claims**

1. Apparatus for applying a thixotropic gel to fibers comprising:

(a) a first block;

(b) a second block;

(c) means for holding the first block and the second block together to form a feed passage for the thixotropic gel; and

(d) an applicator roll rotatably mounted at the outlet of the feed passage such that during rotation of the applicator roll, thixotropic gel feed from the feed passage is sheared between the first block and the applicator roll to reduce the viscosity of the thixotropic gel, the applicator roll

being spaced from the second block such that during rotation of the applicator roll, the thixotropic gel on the applicator roll does not contact the second block.

4,222,345

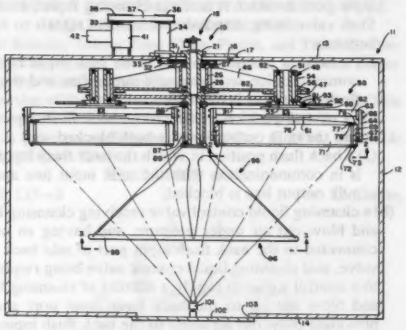
VACUUM COATING APPARATUS WITH ROTARY MOTION ASSEMBLY

Nils H. Bergfelt, and Richard I. Seddon, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Nov. 30, 1978, Ser. No. 965,167

Int. Cl.² B44D *1/34;* **C23F** *1/34*

U.S. Cl. 118—720 **10 Claims**



1. In a coating apparatus for coating substrates, a vacuum chamber, a rotary motion assembly rotatably mounted in the chamber for rotation about an axis, means for rotating the rotary motion assembly, the rotary motion assembly including a plurality of arms, a spindle assembly rotatably carried by each of the arms for rotation about its own axis, each spindle assembly being adapted to carry at least one substrate, means for rotating the spindle assembly on each arm as the rotary motion assembly is rotated so that each spindle assembly is rotated in a plane about the axis of rotation for the rotary motion assembly and about its own axis of rotation, at least one coating source disposed within the chamber generally coincident with the axis of rotation for the rotary motion assembly, a uniformity mask assembly disposed between said source and said spindle assemblies and mounted for rotation about an axis

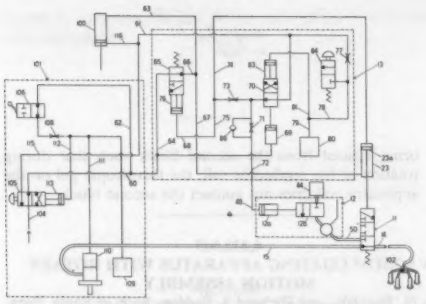
which is generally coincident with the axis of rotation for the rotary motion assembly and in a plane generally parallel to the plane in which the spindle assemblies are rotated and means for rotating the uniformity mask assembly on said axis, said uniformity mask assembly being comprised of a plurality of spaced apart arms having a configuration to modify the vapor distribution from the source so that the average coating deposited on the surfaces of the substrates facing the source is substantially uniform over the surfaces.

4,222,346

MILK LINE BACK FLUSHING METHOD AND APPARATUS

Rolf W. Reisgies, 606 Cooper Rd., Waunakee, Wis. 53597

Filed Nov. 29, 1978, Ser. No. 964,642
Int. Cl.³ A01J *7/00*; B08B *9/00*
U.S. Cl. 119—14.18 **11 Claims**



1. Apparatus for flushing the milking claw and teat cup inflations with a cleansing liquid after milking, comprising:

(a) a milk flow back flush valve adapted to be connected to a milk input line from the milking claw and to a milk output line to the milking vacuum, and having a back flush input port at which it receives cleansing liquid, said back flush valve being responsive to control signals to switch between:

(1) a milking position, in which the milk input line is in communication with the milk output line and the back flush input port is blocked,

(2) a neutral position in which the back flush input port and the milk output line are both blocked, and

(3) a back flush position in which the back flush input port is in communication with the milk input line and the milk output line is blocked;

(b) a cleansing liquid control valve receiving cleansing liquid and blow out air under pressure, and having an output connected to the back flush input port of said back flush valve, said cleansing liquid control valve being responsive to a control signal to supply a mixture of cleansing liquid and blow out air to the back flush input port and for providing blow out air alone to the back flush input port when the control signal is not received;

(c) timing and control means connected to said back flush valve for providing a control signal thereto to switch said valve to its milking position at the initiation of milking, for providing a control signal to said back flush valve a selected period of time after milking has terminated to switch said back flush valve to its back flush position, and for providing a control signal to said back flush valve to switch said valve to its neutral position a selected period of time thereafter, whereby the apparatus is reset for initiation of another milking cycle, and wherein said timing and control means further includes means for providing a control signal to said cleansing liquid control valve when said back flush valve has been switched to its back flush position, and for removing the control signal from said cleansing liquid control valve a selected period of time thereafter and before said back flush valve has been switched to its neutral position.

4,222,347

ANIMAL SHELTER FOR LARGE-SCALE FEEDLOT OPERATIONS

Richard E. Bunger, Phoenix, Ariz., assignor to Corral Industries, Incorporated, Phoenix, Ariz.

Filed Nov. 16, 1978, Ser. No. 961,109
Int. Cl.³ F24F *7/02*; E04B *7/00*; A01K *1/00*
U.S. Cl. 119—16 **2 Claims**

1. A feedlot shelter for confined animals employing improved ventilating means for controlling air movement within and over its outer periphery to compensate for ventilating needs of the animals within and seasonal conditions without comprising:

at least a pair of substantially identical isolated roof sections spacedly positioned from each other a predetermined distance to provide a limited space therebetween,

each roof section sloping upwardly toward each other,

louvered means mounted on said roof sections for cooperatively controlling the air flow through said space and the destructive effects of wind blown rain and snow on the contents in said shelter,

said roof sections each being spacedly mounted over an animal confinement pen built over waste collecting pits,

each confinement pen having a slotted floor for collecting the wastes in the pits below extruded by the animals confined in the pen above,

said roof sections being spaced close enough together to cooperatively provide between juxtapositioned first sides thereof a vent centrally positioned therebetween for aiding air movement within said pens and between said roof sections,

feeding troughs positioned adjacent said pens underneath the high point of each sloping roof section, and

means for enclosing the sides of said shelter between the top of the pens and said roof sections,

a part of said means being selectively movable to open parts of the sides of said shelter for controlling the air flow through said central vent,

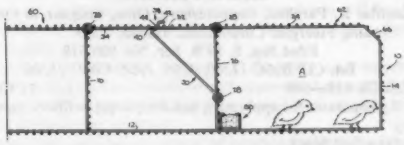
said means comprising portions hingedly connected on the other sides of said roof sections spaced from said vent for variably controlling the air flow through said vent.

4,222,348

STARTER-GROWER CAGE

James M. Nield, Northville, Mich., assignor to Diamond International Corporation, New York, N.Y.

Filed Jan. 25, 1979, Ser. No. 6,512
Int. Cl.³ A01K *31/06*
U.S. Cl. 119—17 **8 Claims**



1. A cage for confining animals particularly poultry comprising a floor, ends, sides and a top, the top comprising a first section and a second section which are adjacently disposed with the first section being adjacent to one end of the cage, the

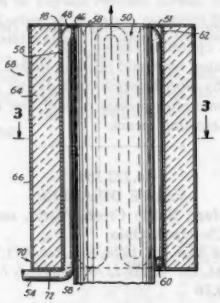
floor, ends, sides and the top first section being fixedly connected, the top second section being pivotably connected and pivotable between a position in which the top second section extends to the other end of the cage such that the first and second top sections form the top for the entire cage and another position in which the top second section extends to the floor of the cage such that the top first section forms the top of a smaller cage defined by the top first section, the top second section, said one end, and portions of the sides and floor, said cage including means to maintain the top second section in each of said positions, said maintaining means including at least one flexible wire-like member pivotably connected to the top second section and having its free end shaped to be releasably engaged by a portion of the cage when the top second section is in said other position and by another portion of the cage when the top second section is in said one position.

4,222,349

STACK EXHAUST HEAT RECYCLING SYSTEM

Bertram Z. Kadan; Seymour Kadan, and Alvin Kadan, all of P.O. Box 234, Greenfield Park, N.Y. 12435

Filed Apr. 24, 1978, Ser. No. 899,450
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 B **7 Claims**



1. A stack exhaust heat recycling system utilizing the heat present in exhaust gases to heat a fluid which comprises an exhaust passage defined by a first shell; an intermediate shell encircling said first shell defining a space therebetween;

tubing means positioned within the space to circulate the fluid proximate the first shell; and

insulation means proximate the tubing means but on the other side of the intermediate shell whereby heat is transferred from the exhaust gases into the circulation means but is substantially retained by the said means, whereby fluids may be elevated in temperature prior to the introduction to a desired position within a system.

4,222,350

EFFICIENT HEATING AND DOMESTIC HOT WATER APPARATUS

Francesco Pompei, Wayland, and Joseph Gerstmann, Framingham, both of Mass., assignors to Boston Gas Products, Inc., Boston, Mass.

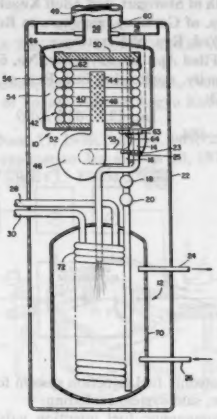
Filed Jun. 26, 1978, Ser. No. 918,829
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—32 **5 Claims**

1. A boiler system comprising:

A. a primary boiler of limited fluid capacity having a plurality of stacked coils surrounding a heat source for heating fluid within said coils

B. a transfer boiler for storing a substantially larger quantity of heated fluid therein and having an elongated coil positioned within said transfer boiler and heated by the fluid therein, and

C. first and second header pipes interconnecting said primary boiler and said transfer boiler and respectively penetrated directly by the corresponding ends of said coils to form a fluid loop interconnecting said boilers, a first of



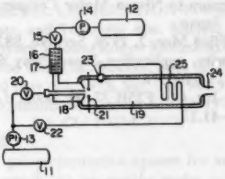
said header pipes being positioned to discharge heated fluid from said primary boiler directly into the interior of said elongated coil to facilitate heat transfer thereto.

4,222,351

PROCESS FOR REFORMING HYDROCARBON FUEL INTO HYDROGEN-RICH FUEL

Katuaki Kosaka, Tokyo; Zene Ueno, Fuchu, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 542,018, Jan. 17, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 778,940
Claims priority, application Japan, Mar. 6, 1974, 49-25914; Mar. 6, 1974, 49-25916
Int. Cl.² F02B *43/10*
U.S. Cl. 123—3 **11 Claims**



1. In a process of reforming a hydrocarbon fuel into a gaseous fuel containing as major components thereof hydrogen and carbon monoxide by making the hydrocarbon fuel react with oxygen and water at an elevated temperature on a motor vehicle and feeding an internal combustion engine serving as the power plant of said vehicle with said gaseous fuel, the improvement comprising utilizing a substantially gaseous mixture of oxygen and steam produced and heated by catalytic decomposition of hydrogen peroxide as a sole source of the oxygen and water for the reforming reaction.

4,222,352
ELECTRICALLY CONTROLLED FUEL INJECTION SYSTEM

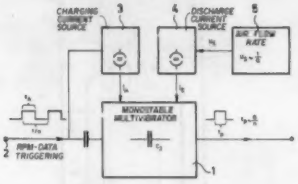
Ulrich Drews, Vaihingen-Pulverdingen; Peter Werner; Helmut Möder, both of Stuttgart, and Adolf Kugelmann, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 19, 1976, Ser. No. 678,315

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517233

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—484 **20 Claims**



1. In an electronic fuel injection system for an internal combustion engine, said system including:

an electromagnetic fuel injection valve associated with each engine combustion chamber;

control multivibrator means including a timing capacitor for defining the time constant thereof and constant current sources to charge and discharge said timing capacitor for generating control pulses of variable length for said electromagnetic fuel injection valves;

means for sensing combustion air flow rate and engine rpm and for supplying control signals related to these variables to said control multivibrator means; and

a final output stage, controlled by said control multivibrator means, for actuating said injection valves;

the improvement comprising:

a trigger circuit, triggered in synchronism with the rotational speed of the engine and jointly connected to said final output stage, thereby defining the onset of fuel injection control pulses and also to said multivibrator for flipping said multivibrator to its unstable state, said multivibrator being connected to said final output stage to thereby define the duration of the output pulses due to controlled discharge of said timing capacitor.

4,222,353
COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

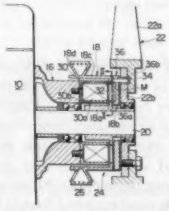
Fumiyuki Abe, and Yoshimasa Hayashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Mar. 2, 1978, Ser. No. 882,642

Claims priority, application Japan, May 6, 1977, 52-51265; Aug. 24, 1977, 52-100576

Int. Cl.² F25B *27/00;* **B60H** *3/04*

U.S. Cl. 123—41.12 **19 Claims**



1. A cooling system for an internal combustion engine having a crank shaft, an electric source and a throttle valve and adapted for propelling a vehicle having a gear box with a plurality of gear ranges, the system comprising:

a cooling fan for cooling the engine when rotatably driven;

means for selectively rotatably driving said cooling fan from the engine crank shaft, said driving means including a normally engaged and selectively disengageable clutch, and

means, including a normally closed switch, for maintaining said clutch in its normally engaged condition; and

means for disengaging said clutch during engine acceleration under an urban area cruising condition of the vehicle propelled by the engine,

said disengaging means comprising:

means for detecting a high load and low vehicle speed engine operating condition to produce a first electric operating signal, said detecting means including a throttle position switch arranged to open when the engine throttle valve opens over a predetermined amount representing the high load engine operating condition, and a gear position switch electrically connected in parallel with said throttle position switch and arranged to open when the gear range in the gear box is selected in a predetermined position representing the low vehicle speed operating condition,

means for opening said normally closed switch in response to said first operating signal, and

means, associated with said opening means, for maintaining said normally closed switch open during a predetermined period of time after receipt of said first operating signal from said detecting means.

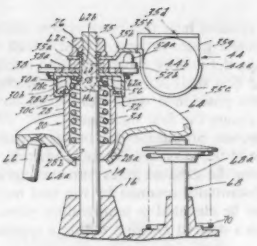
4,222,354
VALVE DISABLER

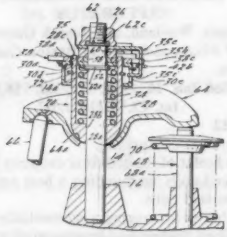
Martin W. Uitvlugt, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 30, 1976, Ser. No. 671,760

Int. Cl.³ F02D *13/06;* **F01L** *1/18*

U.S. Cl. 123—90.16 **15 Claims**





1. An improved valve disabler for a valve selector assembly (adapted to be secured to a rocker arm stud of an internal

combustion engine having a rocker arm which normally pivots about a fixed fulcrum means to open and close an engine valve) the selector assembly includes a control means selectively moveable between a valve enabling position preventing movement of the fulcrum means and valve disabling position allowing movement of the fulcrum means; said improved valve disabler comprising:

sleeve means having said fulcrum means disposed at one end thereof, said sleeve and fulcrum means adapted to be slideably supported by said stud, and said sleeve means and fulcrum means fixed against sliding movement when said control means is in the valve enabling position and allowed to slide along the axis of said stud when said control means is in the valve disabling position;

cap means slideably connected to the other end of said sleeve means; and

spring means reacting between said one end of said sleeve and said cap means for biasing said fulcrum means into engagement with said rocker arm and defining a spring capsule subassembly for said selector assembly.

4,222,355

EXHAUST GAS RECIRCULATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

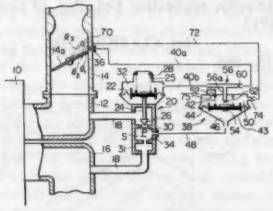
Tatsumi Yamasaki; Isamu Ota; Yutaka Hasegawa; Heisuke Yamamoto, all of Toyota; Noriaki Kawai, Okazaki, and Toshihito Abe, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Kabushiki Kaisha, Kariya, both of, Japan

Filed Nov. 8, 1978, Ser. No. 958,722

Claims priority, application Japan, Jun. 30, 1978, 53-78575

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **7 Claims**



1. An exhaust gas recirculation system of an internal combustion engine having an engine body, an intake device connected to the engine body, a throttle valve arranged in the intake device, and an exhaust device connected to the engine body, said system comprising:

passageways means connecting the exhaust device with the intake device for recirculating a part of exhaust gas from the exhaust device to the intake device;

flow control valve means arranged in said passageway means and having vacuum actuator means for controlling the opening of the valve means;

vacuum conduit means connecting the vacuum actuator means with a first vacuum source formed in said intake device at a position slightly upstream of the throttle valve in its idle condition, the throttle valve engaging with the first vacuum source when the opening of the throttle valve is larger than a predetermined degree;

means for forming a space of predetermined small volume in said passageway means at a position located between the flow control valve means and the exhaust device;

modulator means having a control chamber which is, in accordance with the pressure of the exhaust gas in said space, selectively opened to said vacuum conduit means for controlling the vacuum level in said vacuum actuator means, and;

second vacuum conduit means connecting the control chamber with a second vacuum source in said intake device at a position slightly upstream of the first vacuum source, the throttle valve engaging with the second vacuum source when the opening of the throttle valve is larger than the predetermined degree.

4,222,356

EXHAUST GAS RECIRCULATION FOR A DIESEL ENGINE

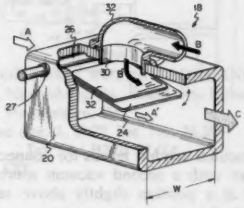
Takehito Ueda, Susono, and Hiroshi Sami, Numazu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 17, 1978, Ser. No. 961,723

Claims priority, application Japan, Sep. 13, 1978, 53-111734

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **3 Claims**



1. An exhaust gas recirculating system for a diesel engine having a gas exhaust passageway connected with an exhaust gas recirculating passageway, and an air intake passageway having an exhaust gas recirculating control valve to which said recirculating passageway connects; said valve forming a straight passageway having a rectangular cross section and flat sides of which one side has an exhaust gas inlet opening to which said recirculating passageway connects, the valve's said straight passageway being connected in series with said air intake passageway and having a rectangular valve plate provided with means for pivoting one edge portion of the plate parallel to and adjacent to said one side and on the upstream side of said inlet opening so that the valve plate swings downstream so as to cover the inlet opening while opening said straight passageway and vice versa, the edges of said valve plate each being parallel to the adjacent one of said flat sides of the valve's said straight passageway and said valve having means for swinging said valve plate.

4,222,357

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Isamu Ota, Toyota, and Toshihito Abe, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Nov. 22, 1978, Ser. No. 962,929

Claims priority, application Japan, Jul. 12, 1978, 53-94959[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—568 **2 Claims**

1. An exhaust gas recirculation system for an internal combustion engine which has an engine body, an intake device connected to said engine body, a throttle valve arranged in said intake device, and an exhaust device connected to said engine body, said system comprising:

passageway means for connecting the exhaust device with said intake device for recirculating exhaust gas from said exhaust device to said intake device;

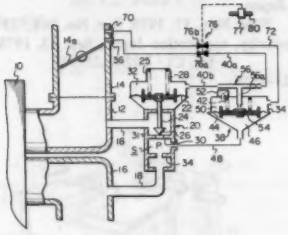
flow control valve arranged in said passageway means and having vacuum actuator means for controlling the opening of said valve means;

first vacuum conduit means for connecting said vacuum actuator means with a first vacuum source in said intake

device at a position slightly above said throttle valve in its idle condition;

means for forming a space of a predetermined small volume in said passageway means at a position located between said flow control valve means and said exhaust device;

modulator means having a control chamber which is selectively opened to the vacuum conduit means, in accordance with the pressure of the recirculated exhaust gas in said space, for controlling the vacuum level in said vacuum actuator means;



second vacuum conduit means for connecting said control chamber with a second vacuum source in said intake device at a position slightly above said first vacuum source; and

vacuum switching valve means responsive to the temperature of said engine for respectively stopping the introduction of a vacuum signal into said vacuum actuator means and said control chamber when the temperature of said engine is in a predetermined range.

4,222,358

FUEL INJECTION SYSTEM

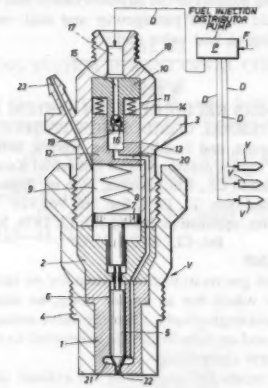
Peter Hofbauer, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,566

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755222

Int. Cl.³ F02M *39/00, 47/02*

U.S. Cl. 123—495 **2 Claims**



1. In a fuel injection system having an injection distributor pump, a plurality of fuel injection valves each having a fuel injection nozzle including a nozzle opening; a conduit system arranged within each fuel injection valve and leading to said nozzle opening; and fuel supply means carrying pressurized fuel from the pump to the fuel injection valves projecting into the combustion chamber of respective cylinders of an internal combustion engine served by the fuel injection system; the improvement wherein said injection distributor pump generates a fuel delivery pressure of medium magnitude; and further wherein with each said fuel injection valve there is associated a pressure booster means for amplifying the pressure of the fuel from the value of medium magnitude to an ejection pressure required for injecting fuel by the respective fuel injection valve into the respective engine cylinder; each pressure booster means comprising a slidably supported stepped piston having oppositely oriented end faces of unlike effective areas and a return spring biasing said stepped piston in one direction; the relatively large end face of the stepped piston being in communication with said fuel supply means for exposure to said fuel delivery pressure of medium magnitude against the force of said return spring and the relatively small end face of the stepped piston being in communication with said conduit system; the improvement further comprising means defining a throughgoing axial bore in said stepped piston and a check valve disposed in said axial bore and arranged to close said axial bore in a direction opposing the force derived from the fuel pressure generated by said injection distributor pump.

4,222,359

INJECTION PUMP, ESPECIALLY FOR MOTOR VEHICLES

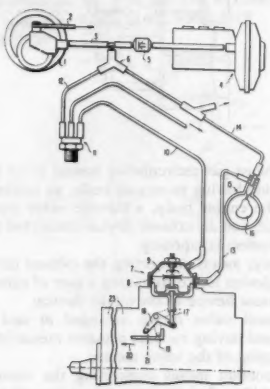
Gerd Niemeier, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,546

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731912

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—366 **9 Claims**

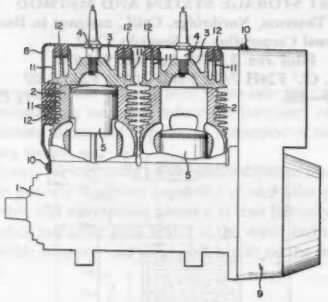


1. An injection pump, comprising control rack means, the control rack means being adjustable by way of a first vacuum box means in dependence on the position of an ignition key, and in which in the stop position of the ignition key, vacuum is applied to the first vacuum box means and the control rack is transferred into a turn-off position by way of the first vacuum box means connected with the vacuum, characterized in that a second, temperature-dependent vacuum box means operable to be connected with vacuum is provided, and in that an upper, control-rack end-position corresponding at least approximately to a full-load position is operable to be determined for the control rack means by way of the second vacuum box means above an engine limit temperature.

4,222,360
INTERNAL COMBUSTION ENGINE HAVING ENGINE COVER

Tetsuzo Fujikawa, Kobe; Shinichi Tamba, Kakogawa, and Yoshiteru Ueda, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jul. 15, 1977, Ser. No. 816,142
Claims priority, application Japan, Jul. 19, 1976, 51-86262
Int. Cl.[2] F02F 7/00; F01P 7/02
U.S. Cl. 123—195 C 7 Claims

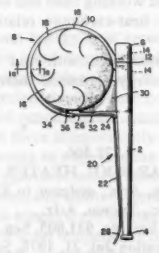


1. An air cooled internal combustion engine comprising crankcase means, cylinder means having horizontally extending outside cooling fins connected with said crankcase means, cylinder head means having vertically extending outside cooling fins connected with said cylinder means, piston means reciprocally mounted in said cylinder means and engine cover means encircling a substantial part of both of said horizontally and vertically extending cooling fins and secured to said engine to define cooling passages between the cover means, the cylinder means and the cylinder head means, said engine cover means being integrally made solely of non-metallic resilient material and having horizontal projection means along its inside side surface to interfit with said horizontal fins and vertical projection means along its inside top surface to interfit with said vertical fins, said cover means having an air intake passage at one end and an air exit passage remotely located therefrom to define said cooling passage means, said cover means acting to suppress vibrations and engine noise.

4,222,361
HAND HELD DISK LAUNCHER

Clifton E. Jackson, 8432 Snowden Pl., Laurel, Md. 20811, and Ronnie L. Kinsley, 5451 Watercress Pl., Columbia, Md. 21045

Filed Jan. 24, 1978, Ser. No. 871,789
Int. Cl.[2] F41B 3/00
U.S. Cl. 124—5 13 Claims



1. A hand held launching apparatus for obtaining greater speed and trajectory control with greater ease when used to throw an object by an arm swinging motion, comprising

(a) arm extension means for extending the effective length of the user's arm, said arm extension means including an elongated handle having a proximal end and a distal end;

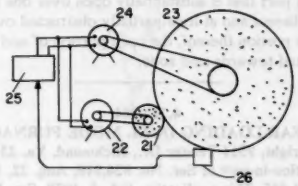
(b) object retaining means movable between a first condition for retaining the object in a launching position in which the object has a proximal side and a distal side and the object is fixed with respect to said elongated handle and a second condition for releasing the object from said elongated handle when said object retaining means is moved to the second condition, said object retaining means includes a flexible strap having one end permanently connected to the distal end of said elongated handle and being wrapped substantially fully around the distal side of the object when said object retaining means is in said first condition; and

(c) rotation imparting means connected with said object retaining means for imparting rotational movement to an object being launched.

4,222,362
SPEED CONTROL FOR A ROTARY DRESSING WHEEL

Russell E. Kaiser, Mercesburg, Pa., assignor to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Apr. 2, 1979, Ser. No. 26,299
Int. Cl.[3] B24B 51/14
U.S. Cl. 125—11 CD 2 Claims



1. In a grinding machine utilizing a rotary grinding wheel, the combination comprising:

a rotary dressing wheel,

a variable speed dressing wheel motor for driving the rotary dressing wheel,

first means for sensing the diameter of the grinding wheel,

a variable speed grinding wheel motor for driving the rotary grinding wheel,

a grinding wheel speed control,

second means for increasing the speed of the grinding wheel as the grinding wheel becomes worn, and

third means for increasing the speed of the dressing wheel as the speed of the grinding wheel is increased to maintain the two wheel speeds in a constant ratio.

4,222,363
DRAFT TUBE FOR WOOD BURNING STOVES

Richard Leavens, Pownal, Vt., and Arthur D. Evans, Williamstown, Mass., assignors to Mohawk Industries, Inc., Adams, Mass.

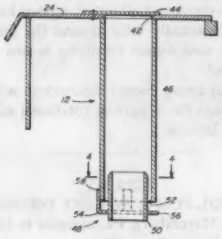
Filed Jul. 28, 1978, Ser. No. 929,186
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—77 4 Claims

1. A nozzle for a stove adapted to burn solid fuel and having a vertically mounted draft tube extending through an upper wall of said stove in the direction of said fuel, comprising

(a) air draft diffuser means defining a pair of air flow paths one along the longitudinal axis of said tube and another generally perpendicular thereto for deflecting one portion of air flowing through said draft tube away from said fuel towards a zone above said fuel and directing another portion of air directly against said fuel, and,

(b) mounting means connected to said diffuser means for mounting said diffuser means to said draft tube,

(c) said diffuser means including a tubular member having an outside diameter less than the inside diameter of said draft tube to define an annular passage therewith when said member is mounted coaxially therein and a flange mounted perpendicularly to the axis of said member and about the outer surface thereof in line with said passage,



said mounting means adapted to mount said member at the inner end of said tube and said flange spaced from the end of said tube,

(d) said flange defining with the end of said tube an annular radial port that is substantially open over one major portion thereof and at least partially obstructed over another major portion thereof, the open portion of said port being oriented towards said zone.

4,222,364

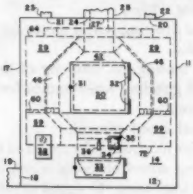
REAR-LOADING DUAL MODE FURNACE

Otis L. Wright, 9511 Telstar Dr., Richmond, Va. 23234

Continuation-in-part of Ser. No. 826,910, Aug. 22, 1977, Pat. No. 4,141,335. This application Feb. 5, 1979, Ser. No. 9,630

Int. Cl.[3] **F24H** *3/00;* **F23B** *1/12*

U.S. Cl. 126—111 **9 Claims**



1. In a furnace comprising a first compartment for the combustion of a solid fuel, and having a grate for supporting said fuel during combustion, a second compartment for the combustion of a fluid fuel, a chamber through which air is circulated in a manner to absorb heat from the walls of said compartments, each of said compartments being constructed at least in part of a thermally conductive material and provided with openings for escape of combustion fumes and admission of air to support combustion, said furnace having a front wall adapted to face into a room into which heat is to be transferred from said furnace, and an opposing rear wall, the improvement comprising:

(a) a chamber of the aforesaid nature, the outer boundaries of which constitute the outer envelope of said furnace and comprise a box-like walled structure which substantially completely surrounds said first and second compartments,

(b) a first compartment of the aforesaid nature having a door in the rear end thereof to permit entrance of solid fuel, means positioned below said grate for the collection of unburned ash from said solid fuel, and mens communicating with the rear wall of said furnace to facilitate removal of said ash, and

(c) a second compartment of the aforesaid nature constructed to surround at least part of said first compartment at a sufficient spacing therefrom to permit air from said chamber to pass therebetween and having means communicating with the rear wall of said compartment for the entrance of fluid fuel.

4,222,365

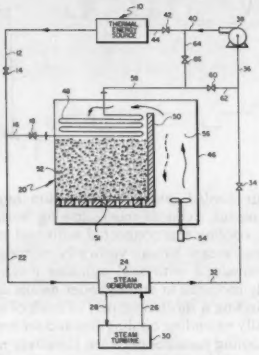
HEAT STORAGE SYSTEM AND METHOD

Wallace B. Thomson, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1978, Ser. No. 912,678

Int. Cl.[3] **F24H** *7/00;* **F28D** *21/00;* **F24J** *3/02*

U.S. Cl. 126—400 **11 Claims**



1. A thermal energy storage system comprising:

a source of heat for heating a heat collecting liquid to a temperature within the range of from about 600° to 1200° F.;

a housing containing a bed of rocks for storage of thermal energy;

a heat transfer gas in heat-exchange relationship with said bed of rocks;

means for moving said heat transfer gas through said bed of rocks at an apparent velocity of from about 1 to 6 ft/sec;

means for causing said heat collecting liquid and said heat transfer gas to flow in counter-current, indirect, heat-exchange relationship with one another, said means including means for reversing the direction of flow of said liquid and said gas;

a working fluid;

means for passing said working fluid and said heat collecting liquid in indirect, heat-exchange relationship with one another; and

means operatively associated with said working fluid to convert thermal energy contained therein to mechanical energy.

4,222,366

SOLAR POOL HEATER

Loren C. Acker, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 831,803, Sep. 9, 1977, Pat. No. 4,146,015. This application Jul. 21, 1978, Ser. No. 926,902

The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.

Int. Cl.[3] **F24J** *3/02;* **E04H** *3/19*

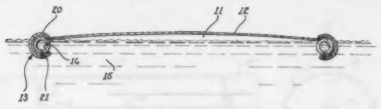
U.S. Cl. 126—415 **23 Claims**

1. A solar pool heater for raising the temperature of the

water in a pool, said solar pool heater comprising in combination:

a. an impervious membrane for convering an area of the water surface in the pool;

b. means disposed about the perimeter of said membrane for maintaining said membrane in a planar configuration, said maintaining means having a specific gravity greater than 1.0 and including a cavity;



c. means for introducing pool water into the cavity of said maintaining means to reduce the buoyancy of said maintaining means and to promote immersion of said maintaining means; and

d. means for capturing an air bubble adjacent said membrane to provide floatation capability of said solar pool heater;

whereby, said maintaining means is at least partially submerged to anchor said solar pool heater in the water and the captured air bubble supports said solar pool heater on the surface of the water.

4,222,367

SOLAR HEAT APERTURE CONTROL APPARATUS

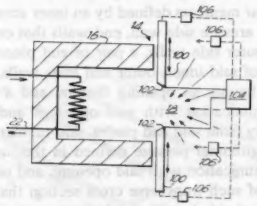
Albert Jubb, Kenilworth, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 17, 1978, Ser. No. 952,215

Claims priority, application United Kingdom, Oct. 18, 1977, 43239/77

Int. Cl.³ F24J 3/02

U.S. Cl. 126—419 **2 Claims**



1. A solar radiant energy heat receiver having a movable entry aperture for receiving focussed radiant energy, said movable entry aperture being varied in size to at least partially define a predetermined temperature profile in a plane of the entry aperture, said movable entry aperture having a periphery defined by at least three independently movable shutters, each of said shutters having an edge forming at least a portion of the periphery of the aperture, temperature sensing means on the edge of each shutter, and shutter operating means operatively connected to each temperature sensing means and operable in dependence on the sense temperature thereof to independently maintain the shutter in a position such that positions of the shutters in combination at least partially define the predetermined temperature profile in the plane of the aperture whereby maximum useful radiation is collected in the receiver without allowing excessive re-radiation.

4,222,368

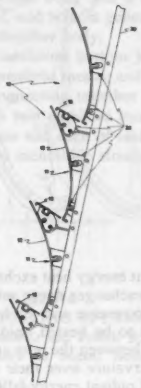
SOLAR ENERGY COLLECTION APPARATUS AND SYSTEM

Duane F. Rost, Canfield, and Gene J. Ameduri, Poland, both of Ohio, assignors to General Extrusions, Inc., Youngstown, Ohio

Filed Dec. 22, 1977, Ser. No. 863,264

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **16 Claims**



1. A fixed position solar energy collector for reflecting and concentrating radiant energy, comprising:

a plurality of reflectors, each said reflector having a reflecting surface for collecting, concentrating, and reflecting solar radiant energy and a non-concentrating surface;

each said reflecting surface facing in a southwardly direction;

a plurality of absorbers, each said absorber on one side thereof collecting said concentrated and reflected radiant energy from an adjacently positioned one of said reflectors, each said absorber having a conduit;

each said absorber spaced from said adjacent reflector;

a support strut for supporting said plurality of absorbers and reflectors;

a plurality of insulating mounting blocks, each said mounting block located on the non-concentrating side of said absorber and said reflector to said strut and insulating said absorber therefrom and securing said absorber;

mounting means for securing said absorbers and reflectors to said mounting blocks and said mounting blocks to said strut;

each said absorber having a 12 degree acceptance angle for receiving radiant energy reflected from said reflector;

said reflector having an end portion located at X=0.0 and Y=0.0 on an X-Y axis grid;

the remaining end portion of said reflector located at the point of about X=8.3 and about Y=7.8 on said X-Y axis grid, and said absorber extending from about 0.25 to about 2.5 on said Y-axis; and

the energy collector having a means for positioning said strut at a discrete number of fixed angular positions to called radiant energy throughout a year.

4,222,369

SOLAR RADIANT ENERGY HEAT EXCHANGER

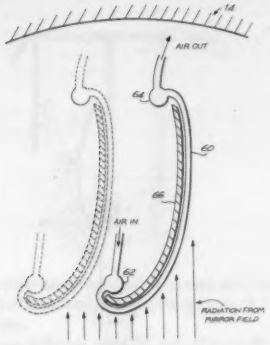
Albert Jubb, and Eric W. Stansbury, both of Kenilworth, England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 13, 1978, Ser. No. 951,254

Claims priority, application United Kingdom, Oct. 18, 1977, 43237/77

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **1 Claim**



1. A solar radiant energy heat exchanger comprising at least one bank of heat exchanger ducts, said bank having inlet and outlet manifolds to receive and discharge respectively a heat exchange medium to be heated, said ducts all being curved along their length between the inlet and outlet manifolds, said ducts having a curvature over their entire axial length such that the amount of radiant energy falling on the ducts per unit area of duct decreases between the inlet and outlet manifolds at such a rate that the duct temperature is substantially constant between said manifolds while the temperature of the medium being heated increases within the ducts, a heat reflector having a substantially same length as the bank of ducts, said heat reflector being mounted closely adjacent and coaxially parallel with respect to a face of said bank of ducts opposite to a face on which the radiant energy falls directly, and means for unidirecting radiant energy onto said ducts.

4,222,370

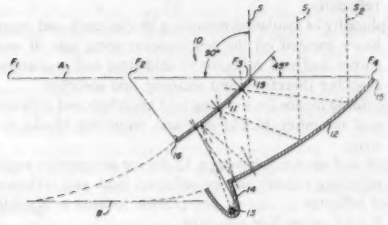
NONTRACKING CONCENTRATING SOLAR COLLECTOR

Arie M. DeGeus, 6625 4th St., South, St. Petersburg, Fla. 33705

Filed May 17, 1978, Ser. No. 906,825

Int. Cl.³ F24J 3/02

U.S. Cl. 126—439 **9 Claims**



1. A nontracking concentrating solar collector comprising a series of parallel parabolic reflector segments reflective on both surfaces thereof, the focal points of said reflectors lying in a plane which is at approximately a right angle to the angle of incident solar radiation which is received in the space between the upper ends of said reflector segments, the length of said reflector segments being selected so that the incident radiation is reflected back and forth between the segments until the fourth and sixth reflection emerges downwardly from between the reflector segments in a beam which is much narrower than the space between the upper ends of the reflector segments, and at least one collector for solar radiation positioned beneath said reflector segments, other than the first segment in the series, and paralleling said segments to receive said narrowed beam.

4,222,371

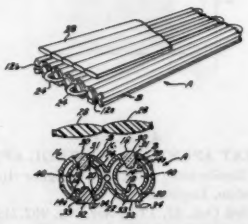
SOLAR ENERGY COLLECTOR

George F. Heath, 4626 E. 7th St. #4, Long Beach, Calif. 90804

Filed Oct. 4, 1977, Ser. No. 839,269

Int. Cl.² F24J 3/02

U.S. Cl. 126—440 **4 Claims**



1. A solar energy collector through which a fluid medium may flow to be heated, said solar energy collector including:

a. a plurality of elongate metallic tubular members that are disposed side-by-side in parallel relationship, each of said tubular members defined by an inner arcuate side wall, an outer arcuate side wall, end walls that connect said inner and outer side walls, a pair of end pieces secured to the ends of said inner, outer and ends walls, said end pieces each having an opening therein, and a pair of tubes in communication with said openings and extending outwardly from said end pieces, said tubular member having a longitudinal passage defined in the interior thereof in communication with said opening, and said tubular members of such transverse cross section that when they are disposed side-by-side in abutting contact they cooperate to define longitudinal first apertures therebetween that are in communication with longitudinal cavities also defined between said tubular members;

b. first tubular means that so connect said tubes in staggered relationship that a fluid medium discharged into a first of said passages on a first side of said plurality of tubular members sequentially traverses all of said passages prior to discharging from a second of said passages on a second side of said plurality of tubular members;

c. primary lens means above said plurality of tubular members for collecting solar rays and focusing the same into said first apertures; and

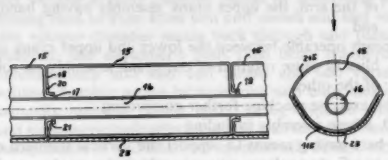
d. secondary lens means in said first apertures for directing said focused solar rays into said cavities to heat said inner side walls, with heat from said inner side walls flowing therethrough to heat said medium flowing through said passages.

4,222,372

SOLAR COLLECTOR ASSEMBLY

Hans-Ulrich Bogatzki, Ferdinand-Hodler-Str. 24, Zürich, Switzerland

Filed Oct. 3, 1978, Ser. No. 948,246
Claims priority, application Switzerland, Oct. 14, 1977, 012617/77
Int. Cl.[3] F24J *3/02*; F28F *1/00*; B65D *21/00*
U.S. Cl. 126—443 6 Claims



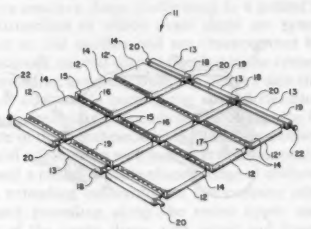
1. A solar energy collector assembly, comprising a plurality of individual collector cells mounted in series along a tube which carries a circulating heat transfer medium, each of said cells having a hollow cylindrical housing made from a material which is transparent to solar radiation, said housing comprising a shell having seamless cylindrical walls of a cross-sectional shape constituted by two curves of different curvature concave towards each other and merging together at the curve ends, said cylindrical walls being provided with end walls extending towards said tube, one end wall having an aperture in its midportion for passage of said tube therethrough and a cylindrical neck extending beyond said end wall parallel to the axis of said tube and fitting around said tube, and the other end wall having an aperture in its midportion fitting the outer diameter of said neck of another housing forming part of another cell.

4,222,373

CERAMIC SOLAR COLLECTOR

Michael A. Davis, 3405 Greenfield Dr., Rocky Mount, N.C. 27801

Filed Jul. 26, 1977, Ser. No. 819,008
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—448 7 Claims



1. A solar collector type energy conversion device comprising:

a plurality of interconnecting absorber modules, each absorber module comprised of an absorber body formed from a fired ceramic material that includes a thermal conductive material additive which increases the thermal conductive value of the absorber body, said absorber body including a plurality of channel like openings formed lengthwise therein from one end thereof to the other end thereof and adapted to continuously pass a transfer fluid therethrough, said openings being disposed generally parallel to an absorber surface of said absorber body, said body having mating configuration means at said ends for mating with an adjacent modular part of said device with said corresponding openings in respective, mutual fluid communication, said plurality of modules arranged in a matrix such that a plurality of modules are located end-to-end in said mutual fluid communication to form a subassembly having an opening at each end thereof and such that said subassemblies are in mutual contacting side-by-side relationship;

manifold means operatively associated in fluid communication with said end openings of said subassemblies such that when the absorber surface of each of the absorber bodies is exposed to the solar source of energy, the same will be transferred into the openings where the transfer fluid can be continuously passed through said device to absorb and carry away the energy so transmitted;

a fired, ceramic foam insulation bottom juxtaposed to that side of each said absorber body that is opposite said absorber surface thereof, said bottom generally corresponding in shape to said absorber body;

a fired, ceramic foam insulation bottom juxtaposed to the bottom side of said manifold means; and

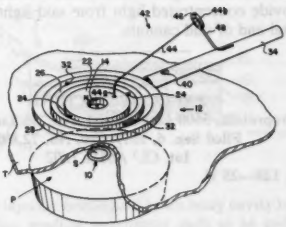
means for integrally connecting together each of said absorber modules, each said manifold means, each of said absorber body bottoms and each of said bottoms of said manifold means into a monolithic structure.

4,222,374

SEPTUM LOCATING APPARATUS

Edward J. Sampson, Concord, and Frank R. Prosl, Duxbury, both of Mass., assignors to Metal Bellows Corporation, Sharon, Mass.

Filed Jun. 16, 1978, Ser. No. 916,129
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R 12 Claims



1. Apparatus for locating a septum in a prosthetic device implanted in a body comprising:

A. means mounted in the device in juxtaposition with the septum for emitting a characteristic energy field that extends exteriorly of the body and defines the location of the septum, said field-emitting means including at least one permanent magnet disposed adjacent the septum,

B. a detector manipulable exteriorly of the body and having at least one component responsive to the energy field emitted from the body, said detector

1. including at least one ferromagnetic part,

2. including means for movably mounting the ferromagnetic parts so that when the detector is moved opposite the general site of the implanted device, the ferromagnetic parts assume characteristic dispositions that indicate the locations of the implanted magnets, and

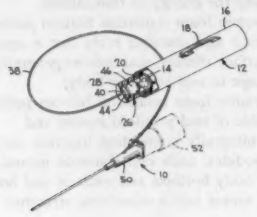
3. producing a characteristic indication when the detector is positioned directly opposite the field-emitting means, said indication thereby designating the precise location on the patient's body surface under which the septum is implanted.

4,222,375

IN VIVO ILLUMINATION SYSTEM UTILIZING A CANNULA WITH A CONICAL OPENING ALLOWING A SNAP-FIT WITH A CONICAL LENS AND AN APERTURE FOR FLOW OF FLUIDS AND UTILIZING A HOUSING WITH A SPHERICAL LENS FOR FOCUSING LIGHT ONTO FIBER OPTICS

Miguel Martinez, 6006 Hunt Ridge Rd., Baltimore, Md. 21210

Filed Mar. 10, 1978, Ser. No. 885,522
Int. Cl.[2] A61B *1/06, 1/12*
U.S. Cl. 128—23 **10 Claims**



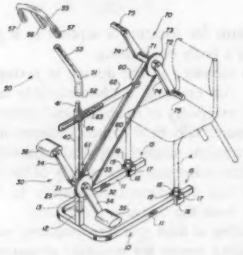
1. An in vivo illumination system comprising
a light source;
an elongate cannula adapted for insertion in a body and having a proximal end and a distal end with an opening therein with a conical configuration; and
a fiber optic cable made of plastic extending through said cannula and having a first lens integrally formed at a distal end thereof and a second lens integrally formed at a proximal end thereof, said first lens having a conically configured portion and being seated in said opening in said distal end of said cannula to seal said opening and said second lens being disposed adjacent said light source to collect and concentrate light whereby said first and second lenses provide concentrated light from said light source at said distal end of said cannula.

4,222,376

EXERCISE MACHINE

Louis Praprotnik, 5500 Lindenwood Ave., St. Louis, Mo. 63109

Filed Sep. 6, 1979, Ser. No. 72,898
Int. Cl.[3] A61H *1/02*
U.S. Cl. 128—25 R **6 Claims**



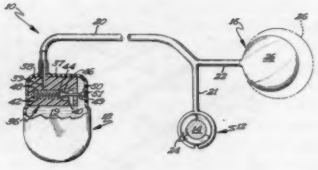
1. An exercise machine by which persons may exercise while seated on seating means having a floor support portion, comprising
A. a substantially vertical standard,
B. a handlebar mechanism including
a stem member mounted rotatably at the upper end of the vertical standard on a vertical axis and sloping upward therefrom, ending in a sloping upper end, and
outward extending handlebars, mounted rotatably along a sloping axis at the upper end of the stem member,
C. a crank mechanism including
a support arm mounted on the vertical standard at a point below its upper end and sloping upward therefrom,
means to adjust the angle of the arm relative to the standard,
a lower crank assembly mounted adjacent to the lower end of the arm, the lower crank assembly having foot pedals,
an upper crank assembly mounted adjacent to the upper end of the arm, the upper crank assembly having handgrips, and
means operable between the lower and upper crank assemblies to cause rotation of one crank assembly on rotation of the other,
the exercise machine further comprising
D. a base assembly including
a base having means to support the vertical standard either in a first angular position, in which the crank assembly is to be utilized, or in a second angular position 180° removed therefrom, and
socket means on the base remote from the support means and positioned genrally in the direction of said first angular position, to accept the floor-support portion of the seating means,
whereby the weight of a person seated on the seating means prevents the exercise machine from tipping, and such person may utilize the crank assembly for exercising the arms or legs or both, or alternately utilize the handlebar mechanism without interference from the crank mechanism.

4,222,377

PRESSURE REGULATED ARTIFICIAL SPHINCTER SYSTEMS

John H. Burton, Minneapolis, Minn., assignor to American Medical Systems, Inc., Golden Valley, Minn.

Continuation of Ser. No. 581,800, May 29, 1975, abandoned.
This application Jun. 27, 1977, Ser. No. 810,050
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—1 R **4 Claims**



1. An artificial sphincter system for reversibly occluding a passageway, said system comprising:
inflatable cuff means substantially encircling a vessel to be opened and closed for constricting said vessel in response to fluid pressure;
means for supplying fluid under pressure comprisingg a manually deformable, elastomeric bulb in fluid flow configuration with said cuff means, said bulb serving as both a fluid reservoir and a pump;
variable volume chamber means in fluid flow communication with the inside of said cuff means for regulating fluid pressure therein by expanding and contracting in response to fluid pressure;
unrestricted flow passage means connecting said supplying

means with both the inside of said cuff means and said variable volume chamber;

check valve means housed within said elastomeric bulb for normally allowing one way passage of fluid from said supplying means simultaneoulsy to said cuff means and said variable volume chamber means through said flow passage means; and

manually operable release means operatively associated with said check valve means for deflating said cuff means and said variable volume chamber means by selectively permitting fluid to flow from said cuff means and said variable volume chamber means back through said passage means to said elastomeric bulb, fluid being transferable simultaneously into said cuff means and said variable volume chamber means by squeezing said bulb, and said manually operable release means being disposed within said elastomeric bulb adjacent a side wall thereof whereby manipulation of said side wall operates said release means to open said check valve.

4,222,378

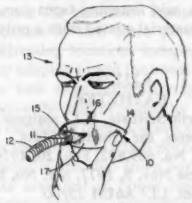
MOUTHPIECE ACCESSORY AND SEAL

Dennis C. Mahoney, 139 Salem St., Apt. 5, Boston, Mass. 02113

Filed Oct. 24, 1978, Ser. No. 954,238

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—206.24 **1 Claim**



1. Mouthpiece accessory for use with the mouthpiece for an intermittent positive pressure breathing apparatus to provide a seal against the escape of gas and permit the incoming gases to be inhaled comprising a flexible faceplate characterized by an ovate convex-concave shape conforming to a patient's mouth area, the extremities of which ovate shape are symmetrical with respect to one another and are characterized by being relatively pointed, an oval shaped opening in the center of said faceplate extending inwardly from the convex side thereof to the concave side, and a rectangular shaped flexible, shape-retaining tube extending perpendicularly outwardly from the concave side of the mouthpiece integral with said concave side and in coaxial relationship with said oval shaped opening in the faceplate, and a raised, arcuate-shaped, edge of uniform height and width extending outwardly on the concave side of the faceplate and extending along the entire upper and lower perimeters of the ovate shape, said upper and lower raised edges joining with one another at the ovate extremities whereby a continuous raised edge is provided along the entire inner periphery of the faceplate.

4,222,379

MULTIPLE BLOOD BAG HAVING PLASTICIZER-FREE PORTIONS AND A HIGH BLOOD COMPONENT SURVIVAL RATE

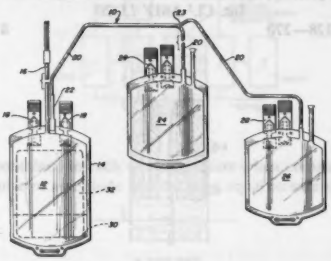
Dale A. Smith, Barrington, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 26, 1978, Ser. No. 955,059

Int. Cl.² A61M *5/00*; A61J *1/00*

U.S. Cl. 128—214 D **37 Claims**

21. In a multiple blood bag system which comprises a donor bag for receiving blood from a donor, at least one transfer bag for receiving a blood component from said donor bag, and conduit means providing sealed, flow communication between said donor bag and transfer bag, the improvement comprising: said transfer bag being made of a translucent, flexible, sterilizable polyolefin material which is free of blood-extractable plasticizers and exhibits a relatively high carbon dioxide diffusion characteristic whereby the pH of platelets stored therein is resistent to reduction, said donor bag being made of a translucent, flexible, sterilizable plastic material which contains from 15 to 50 percent by weight of a blood-extractable plasticizer selected from the group consisting of dioctylphthalates and dioctyladipates.



4,222,380

CELIAC INJECTOR

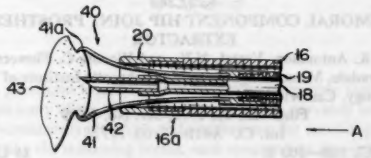
Toshiki Terayama, Kodaira, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1979, Ser. No. 44,569

Claims priority, application Japan, Dec. 2, 1977, 52-162023

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—216 **9 Claims**



1. In a celiac injector introduced into a body cavity by means of an intra-celiac medical instrument such as an endoscope, whereby a medical fluid is injected into celiac tissue, of the type having:

a flexible, elongated outer sheath with an open distal end;

a flexible medical fluid supply tube with a proximal end through which the medical fluid is introduced and capable of sliding in said outer sheath;

an injector needle mounted on the distal end of said supply tube;

a needle driving means connected with the proximal end of said supply tube so that said supply tube may slide relatively to said outer sheath, thereby projecting said injector needle from the open distal end of said outer sheath;

the improvement which comprises

a drive transmission member capable of moving in the longitudinal direction of said outer sheath within a space between said outer sheath and said supply tube;

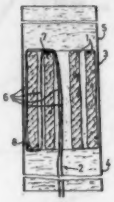
a driving means connected to the proximal end of said drive transmission member, whereby said member is moved relatively to said outer sheath and said supply tube; and

a claw means connected to a distal end of said drive transmission member and capable of moving at the open distal end of said outer sheath in accordance with the operation of said driving means.

4,222,381
MENSTRUAL TAMPON

Leif U. R. Widlund, and Kerstin A. H. Strandberg, both of Mölnlycke, Sweden, assignors to Molnlycke AB, Molnlycke, Sweden

Filed Dec. 15, 1978, Ser. No. 971,012
Claims priority, application Sweden, Dec. 21, 1977, 7714598
Int. Cl.[3] A61F *13/20*
U.S. Cl. 128—270 8 Claims

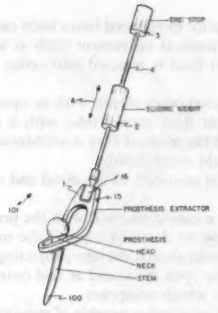


1. A menstrual tampon, comprising at least one web of moisture absorbing material which is rolled up to form several layers, the web having a pull string anchored therein for removing the tampon from the vagina and having ends extending from one end of the tampon, the pull string having a portion extending in a single loop on both sides of at least one of the layers of the absorbing material web and surrounding that side edge of the absorbing material web which is directed toward said end of the tampon from which said ends of the pull string extend, the two string portions which extend from the said loop at the opposite end of the tampon being laid over the side edge of at least one other layer of the absorbent material web situated inside the first-mentioned at least one layer or absorbent material and extending along the side of the said other layer and out said one end of the tampon.

4,222,382
FEMORAL COMPONENT HIP JOINT PROSTHESIS EXTRACTOR

Erik K. Antonsson, Vestal, N.Y., and Woodie C. Flowers, Auburndale, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 26, 1979, Ser. No. 6,699
Int. Cl.[3] A61B *17/00, 17/18*
U.S. Cl. 128—303 R 11 Claims

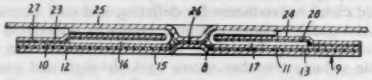


1. A prosthesis extractor comprising a base portion and a pair of spaced jaws, the jaws converging toward each other from a widely-spaced region to closely-spaced region to form an aperture sufficiently large to receive the head of a prosthesis and tapering so as to grasp the neck of the prosthesis securely therein, said jaw, being angled with respect to said base portion to permit the alignment of the stem of the prosthesis with the direction of applied force on the extractor.

4,222,383
SURGICAL DRAPE AND SUTURE

George W. Schossow, 2316 Lilac La., White Bear Lake, Minn. 55110

Filed Aug. 7, 1978, Ser. No. 931,471
Int. Cl.[2] A61B *17/08*
U.S. Cl. 128—335 2 Claims



1. A suture device comprising

a sheet of nonwoven fibrous fabric coated on one surface with nonirritating pressure-sensitive adhesive and having a long narrow centrally disposed slot extending transversely across said sheet to points adjacent opposite side edges thereof,

a release liner covering said adhesive and spanning said slot, and

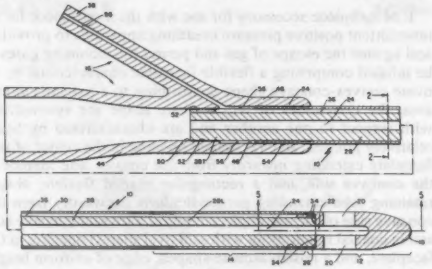
porous fibrous adhesive sheets carrying a plurality of spaced fastening tapes adhesively attaching said tapes on the uncoated surface of said fabric on one side of said slot for attachment to similar fastening tapes on the surface of the sheet on the opposite side of the slot,

said fastening tapes being secured to said uncoated surface at one end and projecting toward the slot and folded back upon themselves, said fastening tapes comprising lengths of flexible wire material coated with a polymeric coating.

4,222,384
CATHETER

William Birtwell, North Scituate, R.I., assignor to Biomedical Engineering Associates, Inc., Boston, Mass.

Continuation of Ser. No. 659,832, Feb. 20, 1976, abandoned.
This application Nov. 9, 1977, Ser. No. 849,961
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—349 B 8 Claims



1. A Foley-type urethral drainage catheter having a tip portion, an elongate body portion having a drainage lumen and at least one inflation lumen, the body portion extending rearwardly from the tip portion, and an inflatable balloon in communication with the inflation lumen, said catheter further comprising:

the balloon portion and tip portion being molded in a single, integral piece in which the balloon portion is formed from a material which is more elastic than that from which the tip portion is formed;

the elongate catheter body being formed from an inner core and an outer sleeve, the forward end of the inner core protruding outwardly beyond the forward end of the outer sleeve, thereby to define a peripheral shoulder at the region of attachment of the catheter body to the trailing end of the balloon portion, the shoulder being dimensioned so that the outer surface of the balloon portion

merges smoothly with the outer surface of the catheter body in a shoulderless configuration.

4,222,385

ELECTRONIC HEART IMPLANT

Richard J. Backhouse, St. Albans, England, assignor to National Research Development Corporation, London, England

Filed Sep. 7, 1978, Ser. No. 940,327
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—419 PG **3 Claims**

1. An electronic heart implant comprising an input/output terminal for connection to an active electrode in the heart of a patient, a stored program digital data processor including a clock pulse generator establishing a predetermined machine cycle period, an input circuit connected to the input/output terminal to provide interrupt signals to the processor at instants determined by the cardiac voltage waveform of the patient, and an output circuit connected to the input/output terminal and comprising a current source controlled by the processor to inject stimulating current pulses at instants determined by the processor, wherein the processor is arranged to detect abnormal heart conditions by determining the period between interrupts by performance of a program effective to count machine cycles between interrupts and to respond to detected abnormal conditions by commanding injection of current pulses at instants occurring at selected times after previously injected pulses and/or after interrupts, and to determine the selected times by performance of a program effective to count machine cycles, and wherein the processor comprises a store having addressable locations in two store portions, an instruction highway for addressing locations independently in the store portion, an adder adapted to add the contents of two addressed locations in the two store portions respectively, a register arranged to receive the sum provided by the adder and interrupt signals and capable of operation as a shift register, connections for writing the contents of two portions of the register in addressed locations in the two store portions respectively, a program counter arranged to count machine cycles and to address a read-only memory providing instructions on the instruction highway and selectively providing shift pulses for the register and a latch enable signal, and a latch arranged to store the instruction on the instruction highway in the presence of the latch enable signal, the latch being connected to the output circuit to control the generation of the current pulses in accordance with the contents of the latch.

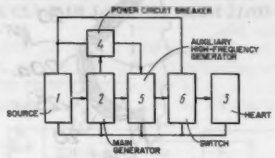
4,222,386

METHOD FOR STIMULATING CARDIAC ACTION BY MEANS OF IMPLANTED ELECTROCARDIOSTIMULATOR AND IMPLANTABLE ELECTROCARDIOSTIMULATOR FOR EFFECTING SAME

Leonid E. Smolnikov, ulitsa Baikalskaya, 47, kv. 29; Boris A. Ivobotenko, Beshilovskaya ulitsa, 17, kv. 34; Adrian B. Aparov, Krasnokazarmennaya ulitsa, 12, korpus 3, kv. 50; Valery I. Shumakov, Smolenskaya ulitsa, 7, kv. 56; Jury I. Abasheev, Energeticheskaya ulitsa, 8, korpus 1, kv. 130; Mikhail M. Isachenko, Vyatskaya ulitsa, 3, kv. 12, all of Moscow, and Vladimir N. Korolev, ulitsa Zavodskaya, 7, kv. 12, Klimovsk-1 Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 888,525, Mar. 21, 1978, abandoned. This application Mar. 26, 1979, Ser. No. 24,048
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **5 Claims**

1. A method for stimulating the cardiac action by means of a self-contained electrocardiostimulator implanted in the patient's body and connected to the heart, comprising the steps of: producing a signal having a plurality of packets, each said packet having a plurality of separate electric pulses each pulse being of a size insufficient to cause the heart to contract and having an interval therebetween; applying said signal having said packet of pulses to the heart to make it contract, such that the number of heart contractions is equal to the number of packets applied to the heart, thereby lessening the amount of



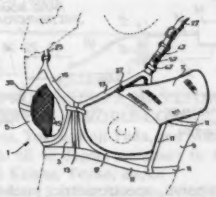
power contained in each of said packets when compared to a single pulse of amplitude and duration equal to said packet.

4,222,387

PROSTHESIS BRASSIERE

Thérése Tetu, 3 Westmount Sq., Apt. 1114, Montreal, Quebec, Canada (H3Z 2P0)

Filed Aug. 16, 1978, Ser. No. 934,066
Claims priority, application Canada, Aug. 26, 1977, 285608
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—460 **13 Claims**



1. A prosthesis brassiere for women who have gone through a mastectomy of the type comprising one cup provided with a filler permanently attached, and another cup for receiving and supporting the remaining breast, each mounted on a peripheral strap, the improvement comprising in that the cup receiving and supporting the remaining breast is provided along its entire periphery with securing means detachably connecting it with its associated peripheral strap, constructed and arranged to allow said other cup to be easily and quickly detached and removed from its peripheral strap, and to be reattached, all while leaving the cup with the filler permanently in place.

4,222,388

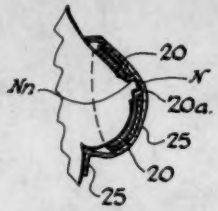
FEMININE BRASSIERE CUP FUR LINING

August R. Brown, Windsor, Colo., assignor to Koshear, Inc., Greeley, Colo.

Filed Aug. 21, 1978, Ser. No. 935,574
Int. Cl.[2] A41C *3/10*
U.S. Cl. 128—479 **5 Claims**

1. In combination with a brassiere clothing garment for feminine wear having individual breast supporting cups, a body chest holding strap and a shoulder strap, the combination therewith of a separate fur-like material conical-like individual inner lining cup having a hide outer surface and a fur inner surface, with each lining cup adapted to be unattachedly positioned within a breast supporting cup of the brassiere, whereby upon feminine breast body wearing of the brassiere, by the brassiere securement to a feminine chest by the chest strap and

with a fur lining cup in each brassiere cup, the fur-lined inserts cups will each be pressure held within its adjacent brassiere



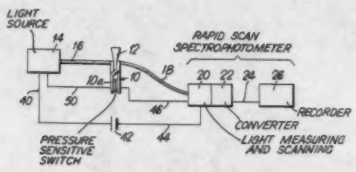
breast cup by the brassiere body securement pressure against the feminine breast.

4,222,389

OBJECTIVE DETERMINATION OF THE RATE OF OXYGEN UTILIZATION IN PERIPHERAL TISSUE

Harry E. Rubens, New York, N.Y., assignor to Institute of Applied Biology Special Cancer Research Project, Bay Harbor Islands, Fla.

Filed Oct. 18, 1977, Ser. No. 843,270
Int. Cl.[2] A61B 6/00
U.S. Cl. 128—633 **5 Claims**



1. A non-invasive, spectrometric method of objectively determining in vivo, the rate of oxygen utilization in peripheral tissue, which comprises isolating a segment of blood in the tissue of the skin, and simultaneously and rapidly obtaining from the moment of blood isolation, the changing light coefficients of absorption for oxyhemoglobin in the isolated blood, at two adjacent wavelengths in which the coefficients of absorption of one wavelength, has a faster rate of change than the other, and determining the rate of change of one light coefficient with respect to the other.

4,222,390

SPHYGMOMANOMETER GAUGE AND METHOD OF USE FOR BLOOD PRESSURE MEASUREMENT

Emanuel Berliner, Valley Stream; Elwyn Spiegel, New York, both of N.Y., and Nobuo Kaneda, Tokyo, Japan, assignors to Bristoline, Inc., Freeport, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,565
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—677 **23 Claims**

1. In an apparatus for measuring blood pressure, a sphygmomanometer gauge for indicating systolic and diastolic blood pressures to a user, comprising:

(a) a housing;

(b) a pressure-calibrated dial mounted on said housing, said pressure-calibrated dial including a scale having a plurality of spaced-apart graduations respectively indicative of different values of blood pressure;

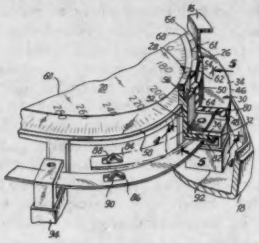
(c) a movable pressure needle mounted on said housing for movement over said pressure-calibrated dial in response to changes in air pressure generated in the apparatus along a first path in which both a systolic pressure measuring position and a diastolic pressure measuring position are located;

(d) manually-movable systolic indicator means mounted on said housing for movement relative to the latter;

(e) manually-movable diastolic indicator means also mounted on said housing for movement relative to the latter;

(f) first user-operated means for manually and adjustably moving said systolic indicator means along a second path spaced from and adjacent to said first path;

(g) second user-operated means for manually and adjustably moving said diastolic indicator means along a third path



spaced from and adjacent to both said first and said second paths; and

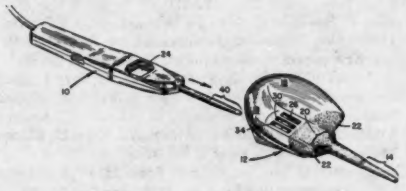
(h) each of said indicator means includes means for indicating a single value of blood pressure, and means for simultaneously indicating a range of values of blood pressure; whereby the user either manually presets each of said indicator means to respective positions corresponding to predetermined medically-established pressure norms for subsequent comparison purposes during the blood pressure measurement, or manually sets each of said indicator means to its respective pressure measuring position as observed during the blood pressure measurement for subsequent leisurely recordation.

4,222,391

UNITARY DISPOSABLE SANITARY SHEATH FOR TEMPERATURE AND RESPIRATION SENSING PROBE

Paul O. Rawson, Easton; Louis E. Nagy, Killingworth, and George J. Veth, Fairfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 771,011, Feb. 22, 1977, abandoned.
This application Feb. 21, 1979, Ser. No. 13,530
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—736 **11 Claims**



1. A unitary disposable sanitary sheath for use with a temperature and respiration probe, comprising an elongated tube having a closed front end, an open and hollow rear end having an interior for insertion of a portion of said probe into said sheath, and a tapered portion extending rearwardly from said front end to said open and hollow rear end, the walls of said tapered portion being substantially thinner than the remainder of the sheath;

said tube further comprising an upper surface disposed rear-

wardly of said tapered portion, said upper surface forming a cup-like scoop opening upwardly from said surface of said tube;

said upper surface being discontinuous so as to form at least one respiration inlet aperture therein, said at least one respiration inlet aperture being in fluid communication with said temperature and respiration probe via the interior of said open and hollow rear end of said tube when said probe portion is inserted into said sheath;

whereby, upon insertion of said probe portion into said sheath, and insertion of said probe portion and sheath into a patient's mouth, air expired through the patient's nose is collected and directed by said scoop into and through said at least one respiration inlet aperture.

4,222,392

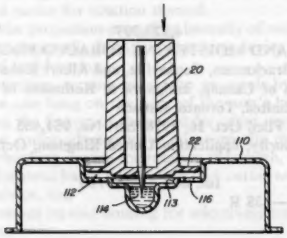
ALLERGY TESTING DEVICE WITH VENTED BASE

Louis G. Brennan, Stockton, Calif., assignor to Alier-Screen, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 939,442, Sep. 5, 1978. This application May 23, 1979, Ser. No. 41,957

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—743 **13 Claims**



1. An improved allergy testing kit for allergen screening comprising:

a base member comprising a plurality of recessed depressions each having a well portion adapted to receive a needle-like prong, each of said depressions having annular ridge means disposed within said depression surrounding said well portion;

a plurality of intracutaneous injection units held in the recessed depressions of said base member and individually removable therefrom, each of said injection units comprising a hilt portion adapted for insertion into the recessed depression of said base member, an upwardly extending handle portion and a downwardly extending skin test prong portion adapted for insertion into a corresponding well, wherein each prong comprises a hollow metal cannula extending from the hilt into the corresponding well, and wherein the handle portion of each injection unit is hollow to receive an upper portion of said cannula, thereby permitting capillary loading of the prongs by dipping the prong into a liquid;

at least one of said prongs being loaded with biologically active allergen; at least one of said prongs being loaded with a histamine control substance; at least one of said prongs being loaded with a diluent devoid of biologically active substance; and

vent means for permitting gas escape during insertion of said injection units into said depressions.

4,222,393

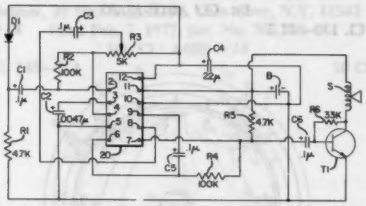
TINNITUS MASKER

Robert W. Hocks, and Jack A. Vernon, both of Portland, Oreg., assignors to American Tinnitus Association, Portland, Oreg.

Filed Jul. 28, 1978, Ser. No. 929,032

Int. Cl.³ A61B *5/00, 5/12;* A61M *21/00*

U.S. Cl. 128—746 **4 Claims**



1. The method of masking a tinnitus sensation of noise in a patient comprising subjecting the patient to external sounds of different pitch, one after another, to enable the patient to identify the particular external sound having the same pitch as the subjective tinnitus sensation of sound perceived by the patient, and then applying to the ear of the patient a power operated sound generator producing a noise output at all frequencies within a range of frequencies extending above and below said perceived pitch.

4,222,394

SYSTEM FOR PROCESSING A WAVEFORM FOR A LARYNX STROBOSCOPE

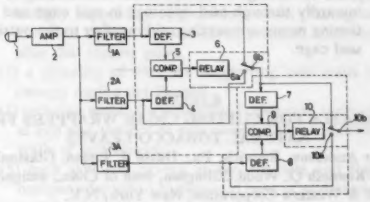
Hironobu Nagashima, Tokyo; Koji Tuda, and Masatoshi Marui, both of Fukuoka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Nov. 13, 1978, Ser. No. 960,515

Claims priority, application Japan, Nov. 14, 1977, 52-152427[U]

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—773 **10 Claims**



1. In a system for sensing a sound vibration signal having a fundamental wave component from a larynx, the system having sensor means for sensing sound vibrations from a larynx and amplifier means receiving the output of said sensor means and producing an amplified output, the improvement comprising: a plurality of at least two filter means each connected to and receiving the output of said amplifier means, first fundamental wave component detecting circuit means comprising first and second amplitude detecting means each connected to and receiving the output of a respective one of said filter means, comparator means connected to and receiving the outputs of said first and second amplitude detecting means, and switch means connected and responsive to the output of said comparator means for detecting the fundamental wave component of said larynx vibration signal.

4,222,395

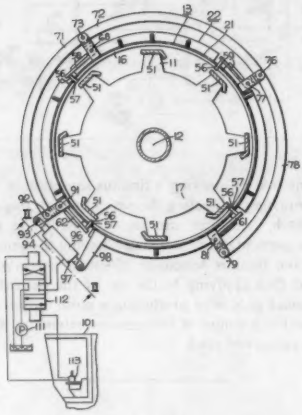
THRESHING CAGE FINGERS FOR RETARDING THE FLOW OF MATERIAL THROUGH AN AXIAL FLOW HARVESTER

David K. Johnston, Blue Springs, and Michael R. Stuber, Raytown, both of Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 900,170, Apr. 26, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 34,345

Int. Cl.[3] A01F *12/20*

U.S. Cl. 130—27 T 13 Claims



1. In an axial flow harvester, the combination of:

In an axial flow harvester, the combination of:

a threshing rotor,

a foraminous cylindrical cage surrounding said rotor in coaxial relation thereto with radial openings permitting crop seeds to pass therethrough,

means for inducing axial flow of crop material through said cage upon rotation of said rotor, and

means for retarding said flow of crop material including

a member on the radially outer side of said cage extending axially of the latter,

a plurality of fingers on said member extending radially inwardly through said openings in said cage and positioning means connecting said member to the outside of said cage.

4,222,396

APPARATUS FOR CUTTING CIGAR WRAPPERS FROM NATURAL TOBACCO LEAVES

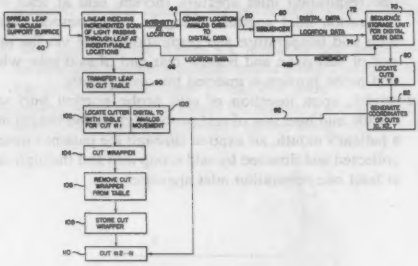
Verner Anderson, Berwick, Pa.; David J. Logan, Glastonbury, and Kenneth O. Wood, Ellington, both of Conn., assignors to Gulf & Western Corporation, New York, N.Y.

Filed May 2, 1978, Ser. No. 902,262

Int. Cl.[3] A24C *1/04, 1/02*

U.S. Cl. 131—105 6 Claims

1. An apparatus for cutting cigar wrappers with a selected profile from a natural tobacco leaf, said apparatus comprising: vacuum means for supporting said leaf in a spread condition and in a random position on a leaf receiving member; means for selecting at least one cut position on said leaf and oriented with respect to said leaf receiving member; a cutting platen including a leaf support surface and means for creating a vacuum at said leaf support surface; means for positioning said platen in a known leaf receiving position with respect to said leaf receiving member; transfer means for transferring said leaf from said leaf receiving member to said leaf support surface when said cutting platen is in said leaf receiving position; a wrapper cutter having said selected profile; means for shifting said platen from said leaf receiving position to a leaf cutting position with said support surface of said platen spaced from said wrapper cutter; means for orienting said platen relative to said cutter to a position with said cutter aligned with said selected



cut position; means for forcing said cutter against said platen whereby a wrapper is cut and separated from said leaf; and means for then transferring said cut and separated wrapper to a selected location for subsequent use.

4,222,397

OPENING AND MOISTENING TOBACCO FROM BALES

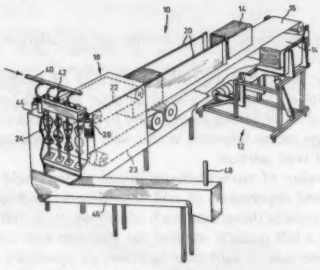
Warren A. Brackmann, Cooksville, and Albert Kuhner, Schomberg, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Oct. 16, 1978, Ser. No. 951,655

Claims priority, application United Kingdom, Oct. 18, 1977, 43372/77

Int. Cl.[3] A24B *3/06*

U.S. Cl. 131—138 R 13 Claims



9. An apparatus for premoistening and opening tobacco in bales, comprising:

means defining a conditioning chamber,

horizontal conveyor means for continuously advancing a succession of bales of tobacco towards and into the conditioning chamber,

a plurality of tobacco removal means mounted in said conditioning chamber for continuously removing tobacco from the leading face of the bale in the conditioning chamber, and

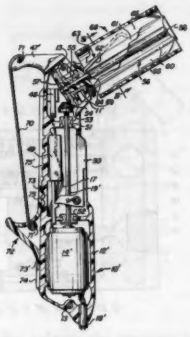
steam impingement means structurally integral with and structurally forming part of said tobacco removal means for impinging steam on said leading face to cause penetration of steam therein.

4,222,398

ELECTRICALLY POWERED HAIR ROLLING DEVICE

Arthur R. A. Fromman, 4517 N. 17th Dr., Phoenix, Ariz. 85015, assignor to Dennis L. Taelman, Phoenix, Ariz.; part interest

Filed Aug. 5, 1976, Ser. No. 711,709
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—34 R **8 Claims**



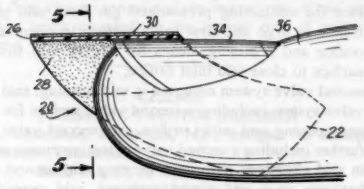
1. A device for rolling hair on a curler comprising:
an elongated type handle grip housing,
a motor mounted in one end of said housing,
a chucking device rotatably mounted on said other end of said housing to extend laterally therefrom and connected to said motor for rotation thereof,
a hook like projection extending laterally of said housing at a point diagonally from said chucking device on the same end of said housing,
said projection serving as a stop or catch by which the device can hang on the edge of the user's hand, thereby freeing the fingers of that hand for other uses,
a hollow curler adapted to be telescopically mounted over said chucking device for rotation therewith,
means for detachably connecting said curler to said chucking device, and
switch means on said housing for selectively energizing said motor.

4,222,399

ARTIFICIAL NAIL

Miruleta Ionescu, 30-36 34th St., Astoria, Queens, N.Y. 11103

Filed Sep. 19, 1977, Ser. No. 834,519
Int. Cl.[3] A45D *29/00*
U.S. Cl. 132—73 **6 Claims**



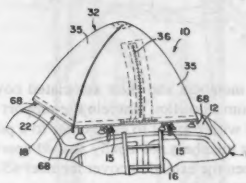
1. A method of forming an artificial nail on a human nail, comprising the steps of positioning a yieldable flat form on a human nail so that a portion of said form conformingly covers a surface zone of said human nail; forming a layer of hardinable artificial nail material only on said form so as to have the same outline as said surface zone; removing said form, together with said layer formed thereon, from said human nail; allowing said layer to partially harden on said form into a cohesive layer having the same outline on said portion as said surface zone; separating said partially hardened cohesive layer from said form, adhering said cohesive layer to said surface zone in conformity with the outlines and shape thereof; and permitting said cohesive layer to completely harden into an artificial nail which fully covers said surface zone and is curved in conformity therewith.

4,222,400

CAR TOP TENT

Paul Reimer, 29 McLoughlin St., Glen Cove, N.Y. 11542

Filed Feb. 7, 1977, Ser. No. 765,880
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—1 A **10 Claims**



1. A portable tent adapted to be mounted on the top of a vehicle having a rigid roof, with a pair of transversely extending supports thereon said portable tent comprising
a. a rectangular support frame including a flange, and said frame adapted for positionment across the supports,
b. a floor mounted within said support frame for supporting the user of said tent,
c. a flexible water repellent canopy including a base and upwardly extending walls joined together, and having an opening along one of said walls to gain access to said canopy, said base extending in overlapping relationship to said floor,
d. a plurality of extending removable flexible rods adapted to extend within said canopy and in an assembled position supporting same during use thereof; as a frame and readily dis-assembled when not in use; said assembled frame comprising
(1) a center support member permanently attached to said canopy centrally therein,
(2) a removable center pole adapted to be releasably secured to said member, and to extend to said floor for initially supporting said canopy when placing said removable rods in its assembled position, and removed after that (center pole),
(3) a plurality of rods for supporting said walls of said canopy during use thereof,
(4) securing means for releasably connecting each said rod at one end thereof to said member for supporting said walls of said canopy,
(5) each said rod having at the opposite end thereof a bumper adapted to engage said base of said canopy and positionable adjacent a wall of said canopy,
e. a rain flap extending peripherally from said walls of said canopy adjacent said base, said flap extending over said flange to prevent water from accumulating between said frame and said canopy onto said floor, and
f. connecting means for tying down said canopy to said frame adjacent said base.

4,222,401

PORTABLE SHELTER

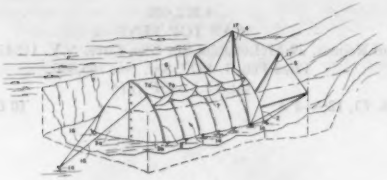
Avraham Allweil, 48 Levi Eshkol St., Tel-Aviv, Israel

Filed Feb. 28, 1979, Ser. No. 16,214
Int. Cl.[3] A45F *1/00*
U.S. Cl. 135—1 R **8 Claims**

1. A portable shelter comprising:
(a) flexible fabric-like cover;

(b) a plurality of arch like rigid support members secured to axially spaced apart portions of the cover;

(c) an axially directed elongated retaining pocket formed on or secured to an outer surface of cover adjacent to apical portions of the support members so as to open outwardly and upwardly when the shelter is erected;



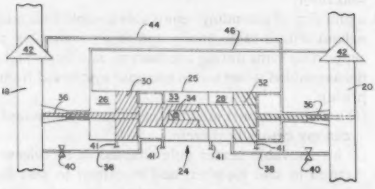
said support members and their associated cover being extendable from a position wherein the support members are juxtaposed with respect to each other to a position where the support members are axially spaced apart, supporting therebetween the extended cover member so as to form an elongated enclosure.

4,222,402

DUAL OVERLAPPING FIRE PROTECTION SYSTEMS AND VALVE

John W. Williams, West Chester, Ohio, assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Aug. 15, 1977, Ser. No. 824,613
Int. Cl.[3] G05D *11/03*
U.S. Cl. 137—87 **4 Claims**



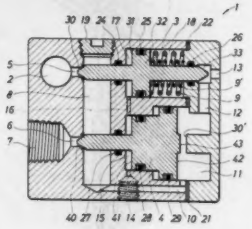
1. A valve mechanism for selectively closing either one of two branch lines connected to a source of fluid under pressure and automatically opening the closed branch line when fluid flows under pressure through the open branch line, the valve mechanism comprising a pair of chambers, a piston in each chamber movable between first and second positions, said pistons being connected to each other, closure means connected to each piston for closing and positively blocking flow through its respective branch line when the piston is in the second position, first fluid supply means connecting a branch line upstream of the closure means to each chamber for supplying fluid thereto to move the respective pistons to the second position, first activating means connected to said first fluid supply means for activating said first fluid supply means to supply fluid to one or the other of said chambers to move the respective piston toward the second position, second fluid supply means connected to each chamber for supplying fluid thereto to move the respective pistons to the first position and second activating means in each branch line and connected to said second fluid supply means for automatically activating each second fluid supply means and moving the piston associated with the closed branch line toward the first position when fluid flows through the branch line associated with the other piston.

4,222,403

AUTOMATIC DRAIN EXHAUST VALVE

Yoshiteru Sonoda, Osaka, Japan, assignor to Fuji Kinzoku Kohsaku Co., Ltd., Osaka, Japan

Filed Oct. 12, 1978, Ser. No. 950,897
Int. Cl.[3] F16T *1/14*
U.S. Cl. 137—183 **9 Claims**



1. An automatic drain exhaust valve for exhausting drain liquid from a pressurized gas system, said automatic drain exhaust valve comprising:

a housing, said housing defining an intermediary space having an inlet orifice means leading into the intermediary space and an outlet orifice means leading from the intermediary space, said inlet orifice means having the function of receiving pressurized gas and drain liquid from said pressurized gas system and said outlet orifice means having the function of exhausting said drain liquid from said housing while not substantially exhausting said pressurized gas from said housing, said housing further defining chambers means for housing valve actuation means and a pilot-entrance means communicating with a portion of said chambers means said pilot-entrance means having the function of receiving compressed gas from said pressurized gas system and communicating said compressed gas to said portion of said chambers means;

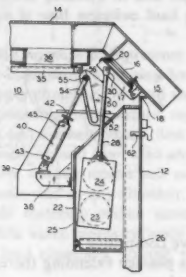
a first valve system including a first valve surface for opening and closing said inlet orifice and a first valve actuation means mounted in said chambers means for moving said first valve surface between open and closed positions, said first valve actuation means including a first reaction surface for contacting pressurized gas from said pilot entrance to urge said first valve surface to open said inlet orifice and a biasing means for urging said first valve surface to close said inlet orifice;

a second valve system mounted in said housing, said second valve system including a second valve surface for closing and opening said outlet orifice, said second valve system further including a second valve actuating means mounted in said chambers means for moving said second surface between open and closed positions, said second valve actuating means including a second reaction surface for contacting pressurized gas from said pilot entrance to urge said second valve surface to open said outlet orifice and a third reaction surface, which is larger than said second reaction surface for contacting fluid in said intermediary space for urging said second valve surface to close said outlet orifice, said housing defining a combination path for communicating said intermediary space to a portion of said chambers means.

4,222,404
SYSTEM FOR OPENING AND CLOSING DOORS TO A VACUUM BODY

Thomas P. Flynn, Milwaukee, Wis., assignor to Super Products Corporation, New Berlin, Wis.

Filed Nov. 29, 1978, Ser. No. 964,668
Int. Cl.[3] B08B 5/04
U.S. Cl. 137—205 4 Claims



1. An apparatus for selectively opening and closing two openings of a housing comprising:

door means mounted adjacent each of said openings for being selectively moved into and out of sealing engagement with said openings;

a pair of cylinder means mounted to said housing and each including an extensible piston means arranged whereby extension of said piston means causes said doors to be moved into sealing engagement with said openings;

fluid supply and exhaust means coupled to said cylinder means for causing selective extension and retraction of said piston means;

valve means and switch means coupled to said fluid means for selectively causing extension or retraction of said piston means at the discretion of the operator of the apparatus;

sensor means mounted within said housing and adapted to emit a signal in response to a filling condition of said housing, said sensor means being coupled to said valve and switch means to automatically cause extension of a first one of said piston means to cause a first one of said doors to be moved into sealing engagement with its respective opening when said filling condition has been reached; and

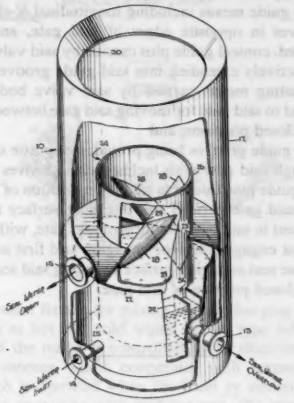
float closure means coupled to said first door means for positively closing its respective opening when the level of liquids contained within said housing reaches a preselected height, said first piston means being coupled to said float closure means and the second one of said piston means being coupled to the second one of said door means.

4,222,405
PRESSURE VACUUM BREAKER

Axel E. Rosenblad, Highlands, N.J., assignor to Rosenblad Corporation, Princeton, N.J.

Filed Jul. 12, 1978, Ser. No. 923,775
Int. Cl.[3] E03C 1/10
U.S. Cl. 137—216.1 6 Claims

1. A pressure vacuum breaker comprising a well having a generally flat bottom and an upstanding generally cylindrical side wall for containing a quantity of liquid; liquid supply and overflow means communicating with said well to maintain a normal liquid level in the well; a generally cylindrical vertical conduit extending upward generally coaxially with said side wall from a level below the normal liquid level in the well to a height above said normal liquid level, a lower end of said conduit being spaced from said well bottom, said wall and conduit being housed within a generally cylindrical housing coaxial therewith and spaced from said well side wall; an annular partition plate surrounding said conduit above said well and extending between said conduit and said housing; and means for communicating to said well pressure in a vessel to be

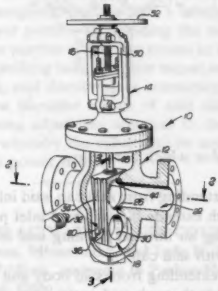


protected by the pressure vacuum breaker for displacing liquid from said well whenever such pressure exceeds pressure limits, whereupon gas or vapor can pass freely through said conduit, said pressure communicating means including an annular space between said housing and said side wall.

4,222,406
WEDGE-TYPE GATE VALVE

Louis C. Schaefer, 615 Roosevelt Dr., Oceano, Calif. 93445

Filed Aug. 7, 1978, Ser. No. 931,760
Int. Cl.[3] F16K 3/14, 3/36
U.S. Cl. 137—246.22 7 Claims



1. In a gate valve, the combination of:

(a) a valve body provided therein with a valve chamber and provided therethrough with a flow passage intersecting said valve chamber;

(b) a gate movable longitudinally of itself in said valve chamber and transversely of said flow passage between open and closed positions, said gate having an opening therethrough which registers with said flow passage in said open position of said gate;

(c) said valve body being provided with first and second annular seats for said gate which encircle said flow passage on opposite sides of said gate, with said first seat having a planar face parallel to the direction of movement of said gate and with said second seat having a planar face

oblique to the direction of movement of said gate, with said gate having corresponding parallel and oblique seat engaging planar surfaces;

(d) guide means carried by said valve body and engageable with said gate for guiding said gate between said open and closed positions;

(e) said guide means including longitudinal V-shaped guide grooves in opposite edges of said gate, and including aligned, conical guide pins carried by said valve body and respectively extending into said guide grooves;

(f) actuating means carried by said valve body and connected to said gate for moving said gate between said open and closed positions; and

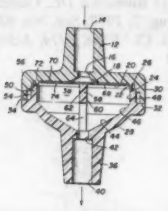
(g) said guide grooves being provided opposite said opening through said gate with inclined cam grooves into which said guide pins extend in said open position of said gate to cam said gate parallel seat engaging surface against said first seat in said open position of said gate, with said parallel seat engaging surface engaging said first seat and said oblique seat engaging surface engaging said second seat in said closed position of said gate.

4,222,407

ONE-WAY FLEX VALVE

Ricky R. Ruschke, McHenry, and Bette R. Schwades, Ingleside, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 13, 1978, Ser. No. 942,076
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—512.15 **15 Claims**



1. A check valve which comprises:

a cap;

an inlet port extending from said cap, said inlet port defining a bore which extends through said inlet port;

a body defining an internal opening and in peripheral engagement with said cap;

an outlet port extending from said body and defining a bore which extends through said outlet port;

a rib carried by said body and extending across said opening; and

a flexible diaphragm located within said opening and supported and urged against the cap by said rib substantially along the entire length of the rib, said diaphragm being engaged against the cap to close the valve with the peripheral edges of the diaphragm being adapted to bend away from the cap to open the valve when a predetermined fluid pressure differential exists between the inlet port and the outlet port;

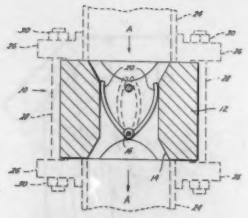
said inlet port having an area less than 36 percent of the area of said flexible diaphragm, whereby said diaphragm is prevented from being pushed into said inlet port as a result of back pressure.

4,222,408

CHECK VALVE

Lomis Slaughter, Jr., Houston, Tex., assignor to Anderson, Greenwood & Co., Houston, Tex.

Filed Jul. 21, 1978, Ser. No. 926,908
Int. Cl.[3] F16K *15/03*
U.S. Cl. 137—518 **1 Claim**



1. A check valve comprising

a body having a passage extending therethrough,

a pair of opposed vanes,

means for pivotally mounting said vanes within said body passage including a pin extending through said passage on which said vanes are mounted,

said vanes being sufficiently large and of proper configuration to substantially close said body passage to prevent flow therethrough,

means resiliently urging said vanes in a direction away from their closed flow position,

each of said vanes having an arcuate shape in section with respect to the flow axis of said body passage to create a venturi restriction in said passage whereby flow in either direction creates a lift on said vanes tending to move them toward closed flow position,

said vanes are adapted to close flow when flow in one direction reaches a pre-selected maximum, and

said vanes developing sufficient lift forces from flows in the opposite direction whereby they modulate the flow to be substantially constant independent of pressure through a considerable range.

4,222,409

LOAD RESPONSIVE FLUID CONTROL VALVE

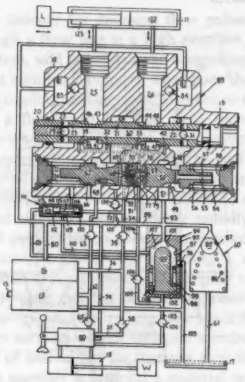
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 773,421, Feb. 28, 1977, Pat. No. 4,122,865, and a continuation-in-part of Ser. No. 894,111, Apr. 17, 1978, Pat. No. 4,147,178, and a continuation-in-part of Ser. No. 894,112, Apr. 17, 1978, Pat. No. 4,140,152, said Ser. No. 894,111, is a continuation of Ser. No. 716,360, Aug. 20, 1976, Pat. No. 4,107,923, said Ser. No. 894,112, is a division of Ser. No. 716,360,. This application Oct. 6, 1978, Ser. No. 949,250
Int. Cl.[3] F15B *13/08*
U.S. Cl. 137—596.13 **22 Claims**

1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, positive load pressure sensing means, negative load pressure sensing means, and exhaust means, first valve means for selectively interconnecting said fluid load chambers with said positive load pressure sensing means and said negative load pressure sensing means, said supply chamber and said exhaust means, first variable metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber having means operable to maintain pressure differential across said first variable metering orifice means at a relatively constant

level, third valve means having outlet fluid throttling means between said load chamber and said exhaust means having means operable to maintain pressure differential across said second variable metering orifice means at a relatively constant level and synchronizing means having means responsive to pressure in said supply chamber, means responsive to pressure in said negative load pressure sensing means and deactivating means, said synchronizing means operable to deactivate said third valve means when pressure in said supply chamber is higher than pressure in said negative load pressure sensing means.

4. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, positive load pressure sensing means, negative load pressure sensing means, and exhaust means, first valve means for selectively interconnecting said fluid load chambers with said positive load pressure sensing means and said negative load pressure sensing means, said supply chamber, and said exhaust means, first variable metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable metering



orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber and control means of said fluid throttling means having force means responsive to fluid pressure in said positive load pressure sensing means, and deactivating means of said force means having valve means operable to connect said second valve means with said exhaust means.

18. A load responsive valve assembly comprising a housing having fluid inlet means connected to a pump, first and second load chambers and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chambers with said fluid inlet means and said fluid exhaust means, said first valve means having fluid throttling means operable to throttle fluid flow between said load chambers and said fluid exhaust means, pressure sensing means to sense pressure upstream of said fluid throttling means selectively communicable with said load chambers by said first valve means, exhaust relief valve means interposed between said fluid exhaust means and said reservoir means, and exhaust pressure unloading means in said fluid exhaust means having means responsive to said pressure sensing means.

4,222,410

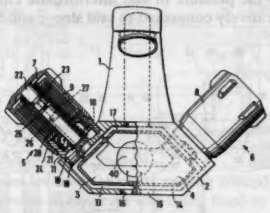
OUTLET FIXTURE FOR FLUID MEDIA

Josef Geimer, Drunen, Netherlands, assignor to Turk & Bolte, Suemmern, Fed. Rep. of Germany

Division of Ser. No. 721,964, Sep. 10, 1976, Pat. No. 4,141,383. This application Jun. 5, 1978, Ser. No. 912,890

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—606 **2 Claims**



1. In an outlet fixture for mixing and discharging two fluid media, such as hot and cold water, of the type wherein the discharge of the media is controlled by an electronic circuit having an antenna which cooperates with magnetic valve means which is operated when the hand or similar object is brought into proximity with said antenna, the improvement comprising a base portion including a mixing chamber for the fluid media, two media supply pipes for supplying the respective fluids to the mixing chambers, two magnetic valves for controlling the flow of fluids to the mixing chamber connected to said base portion, each of said valves comprising a shifting bolt and membrane means controlled by the shifting bolt, the single discharge means connected to the base portion to receive the mixed fluids from the mixing chamber and discharge same from the front side of the fixture, said base portion also including said electronic circuit and its associated antenna, said antenna being positioned in the front side of the base portion, a pair of hand operable rotatable knobs, one for each of said magnetic valves, said knobs being manually adjustable for establishing the maximum of flow through the respective valves, at least one of said magnetic valves comprising, in addition to the magnetic shifting bolt, a tubular sleeve means which has a lower portion surrounding the magnetic shifting bolt and an upper portion containing means to limit the shifting of the magnetic shifting bolt, shoulder means on the exterior of said shifting bolt, said sleeve means containing a flange means for engaging the shoulder means of said shifting bolt, said sleeve means being adjustably attached to the knob for said magnetic valve whereby the valve may be manually operated in the event of a power failure.

4,222,411

LEVER ACTUATED FLUID COUPLING

Eugene H. Herzan, Minnetonka, and Lyle R. Johnson, Minneapolis, both of Minn., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

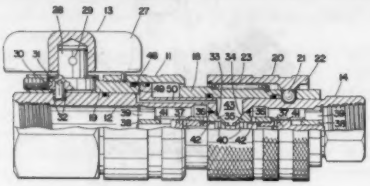
Filed Jan. 19, 1979, Ser. No. 4,776

Int. Cl.³ F16L *37/28, 29/00*

U.S. Cl. 137—614.04 **4 Claims**

1. A coupler comprising a female number including a body, a sleeve, cam means extending between the body and said sleeve, said cam means being the sole means for controlling and effecting relative axial movement between said body and said sleeve, said sleeve having an axially inner end and an axially outer end, body valve means carried by said sleeve and movable by operation of said cam means between a fully open position hydraulically connecting said ends and a fully closed position hydraulically isolating said ends, a male member including a nipple portion capable of being coupled to said female member near said inner end, said nipple having nipple valve means movable for operation of said cam means between

a fully open position and a fully closed position, locking means holding said nipple portion on said body and preventing relative axial movement between said nipple portion and said body when said body valve means is moved between said fully closed position and said fully open position by operation of said cam means, said nipple valve means and said body valve means defining an intermediate chamber when said members are coupled, said inner end of said sleeve having a transverse area facing in a direction toward said nipple portion and being exposed to the pressure in said intermediate chamber, surface means operatively connected to said sleeve and having a transverse area facing in a direction away from said nipple, portion said body having a cylindrical surface said surface means and said cylindrical surface defining an expansible chamber, means hydraulically connecting said expansible chamber and said intermediate chamber when said body valve means and said nipple valve means are both in said fully closed positions and conveying fluid under pressure from said intermediate chamber to said expansible chamber when said body valve means and said nipple valve means are both moved between said fully closed positions and said fully open positions by operation of said cam means said fluid under pressure in said expansible chamber biasing said sleeve toward said nipple portion.



4,222,412

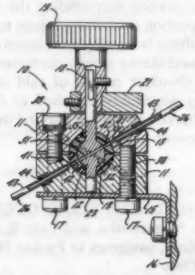
HIGH PRESSURE VALVE FOR CHROMATOGRAPHY

Don W. Carle, La Habra, Calif., assignor to Carle Instruments, Inc., Anaheim, Calif.

Filed Jan. 15, 1979, Ser. No. 3,113

Int. Cl.³ F16K *5/06*

U.S. Cl. 137—625.47 **2 Claims**



1. A valve comprising, in combination, a rigid outer body having an inner hollow surface, an inner rigid element mounted for movement relative to said body and having an outer surface that is complementary to and spaced from said hollow surface, a sealing member formed of cold flowable, non-absorbing material substantially confined within the space between said hollow surface and said outer surface, means for applying substantial pressure to compress and cold flow said member between said surfaces, said element having at least one passage therethrough, said outer body and said member having valve ports that are alined with said passage in at least one position of said relative movement between the element and the body, and said inner hollow surface being sperical and said body being formed in two halves, said element outer surface also being spherical and said element being rotatable in said body, said sealing element being shaped as two cup-like halves of a hollow ball, and said means applying said pressure acts by drawing together said body halves containing the element and the member.

4,222,413

SHUT-OFF VALVE

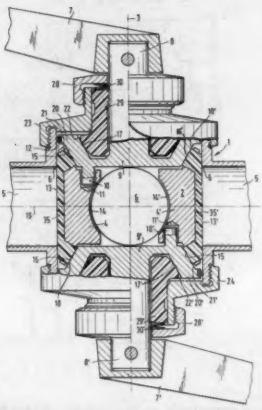
Gunter Wulf, Wangen im Allgau, Fed. Rep. of Germany, assignor to Hermann Waldner GmbH & Co., Wangen im Allgau, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,942

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705625

Int. Cl.² F16K *11/22*

U.S. Cl. 137—637.3 **4 Claims**



1. A shut-off valve comprising:

a housing having a cylindrical bore therein;

four circumferentially spaced pipe connections radially opening into the housing in a direction substantially perpendicular to said bore;

a first closure member in direct sealing contact with the cylindrical bore of the housing to sealingly close off any selected one of said pipe connections;

a second closure member, having a construction identical to that of said first closure member, in direct sealing contact with the bore to close off any selected one of said pipe connections;

a first upper cover on the upper end of the housing;

a second lower cover on the lower end of the housing;

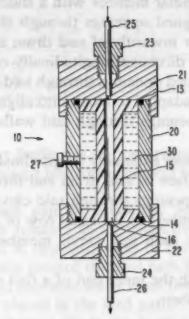
a first actuating member extending through the first cover and connected to the first closure member for controlling movement thereof within the bore; and

a second actuating member, having a construction identical to that of said first actuating member, extending through the second cover and connected to the second closure member for controlling movement thereof within the bore.

4,222,414
PULSE DAMPER FOR HIGH-PRESSURE LIQUID CHROMATOGRAPHY

Pierre Y. Achener, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 881,285, Feb. 27, 1978, abandoned.
This application Jun. 14, 1979, Ser. No. 48,320
Int. Cl.[3] F16L *55/04*
U.S. Cl. 138—30 2 Claims



1. A pulse damper for damping flow pulsations in a fluid passing through a flow line in a high pressure liquid chromatography system, said pulse damper comprising,

an elongate member having an axial bore therethrough;

means for coupling said elongate member to said flow line to provide a flow path for said fluid through said pulse damper via said bore, said elongate member being made of a homogeneous non-porous material and having a wall portion that is unsupported by any solid supporting member in a radial direction perpendicular to said axis of said bore, said elongate member being radially expandable at said wall portion when pulses occur in said flow line;

means forming a cavity for retaining a confined liquid around said elongate member, whereby radial expansion of said elongate member causes compression of said liquid in said cavity, said cavity being the space formed between the outer surfaces of said elongate member and the inner surfaces of said means for forming a cavity, wherein said elongate member is made of a material selected from the group consisting of polytetrafluoroethylene and polychlorotrifluoroethylene and wherein said cavity, in operation, is filled with a compressible liquid, said liquid having an average compressibility, Xa, and instantaneous compressibility, Xi, at pressure above 1000 psi such that 100(Xa−Xi)/Xa is substantially less than 50 percent.

4,222,415
MECHANICAL DEVICE INTERPOSED BETWEEN A DOBBY AND A WEAVING LOOM

Joseph Palau, Duingt, France, assignor to Etablissements Staubli, Faverges, France

Filed Feb. 22, 1979, Ser. No. 14,178
Claims priority, application France, Apr. 18, 1978, 78 12858
Int. Cl.[2] D03C *13/00*
U.S. Cl. 139—83 1 Claim

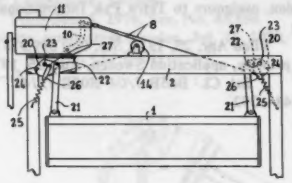
1. A mechanical device interposed between each pulling arm of a dobby or other shedding mechanism supported by the structure of a weaving loom and the corresponding heddle frame of the loom, comprising:

a pair of sector levers supported by pivots on said loom structure and spaced apart along the corresponding heddle frame, the sector levers having pivot pins spaced from their pivots to the loom structure;

spaced connecting rods pivotally attached to the corresponding heddle frame and extending toward and coupled to the adjacent sector levers at said pivot pins;

each sector lever having a curved contour profile, and the respective pivot pins being located substantially inside the contour; and

a pair of cables extending from the pulling arm respectively

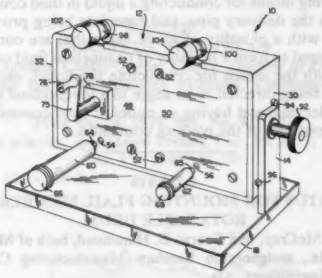


to the sector levers, each cable passing around the curved contour profile of the lever and being fixed to the lever at a point remote from the corresponding pivot pin, one cable extending obliquely and directly from the arm to one sector lever, and the other cable extending obliquely from the arm to the other sector lever guided by a single central pulley carried by the loom structure.

4,222,416
APPARATUS FOR CONTROLLABLY DISPENSING A VISCOUS RESIN AND REACTIVE HARDENER

William Green, Irvington; Sidney Heisler, Colonia, and Jay Riazanow, Rockaway, all of N.J., assignors to Oxydental Products, Inc., Irvington, N.J.

Filed Nov. 13, 1978, Ser. No. 959,869
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—27 9 Claims



1. Apparatus for separately dispensing a viscous epoxy resin material and a liquid material hardener for said epoxy resin in a measured proportion to one another comprising, in combination:

a housing including at least two compartments with each containing one of said materials;

means for adjustably rotating said housing about a longitudinal axis between a first and second stationary position;

a first aperture communication with said compartment storing said epoxy resin material;

a second aperture communicating with said compartment storing said liquid material hardener;

said first and second apertures being exposed to the exterior of said housing with each being in a predetermined location such that in said first stationary position each aperture lies above the surface level of each material and in said second stationary position each aperture lies below the surface level of each material; and

first and second syringe means extending into each compartment through each aperture for separately withdrawing

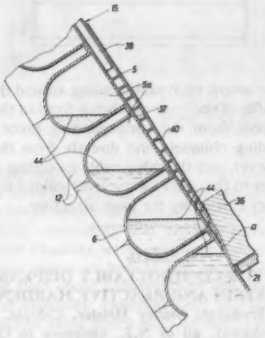
and dispensing a predetermined measure of said epoxy resin and reactive hardener in a predetermined proportion.

4,222,417

FILLER PIPE FOR PACKING MACHINES

Pär M. Andersson, Bjärred, and Bengt A. Rosberg, Höör, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Apr. 25, 1978, Ser. No. 899,973
Claims priority, application Sweden, Apr. 25, 1977, 7704706
Int. Cl.[2] B65B 3/04; B05B 1/14
U.S. Cl. 141—392 **11 Claims**



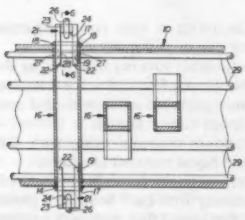
1. In a packing machine having a row of mutually connected packing containers to be filled with liquid contents, the improvement comprising a filler pipe having a delivery pipe and a nozzle part, the nozzle part comprising an elongated baseplate having means for conducting a liquid in fluid communication with the delivery pipe, said baseplate being provided on one side with a plurality of guide vanes that are constructed and arranged to form a plurality of channels in fluid communication with the means for conducting the liquid, each of the channels being directed at an angle to a longitudinal direction of the filler pipe and having an outlet in fluid communication with at least one of the packing containers.

4,222,418

APPARATUS FOR MOUNTING FLAIL MEMBERS ON A ROTATABLE DRUM

Philip C. McCray, and George B. Hammond, both of Montgomery, Ala., assignors to Kershaw Manufacturing Company, Inc., Montgomery, Ala.

Filed Mar. 6, 1979, Ser. No. 17,939
Int. Cl.[3] B27L 1/00
U.S. Cl. 144—2 Z **7 Claims**



1. Apparatus for mounting flail members on a drum with said drum being adapted for rotation about its longitudinal axis comprising:

(a) a plurality of circumferential angularly spaced rows of openings in said drum with the openings of each row being spaced longitudinally of said drum at locations for attaching flail members,

(b) a tubular member rectangular as viewed in cross section extending through each of said openings in said drum and toward the longitudinal axis of said drum,

(c) means securing each said tubular member rigidly to said drum,

(d) a clevis member having parallel legs extending inwardly of each said tubular member with a sliding fit,

(e) transverse aligned openings through the walls of each tubular member inwardly of said drum and aligned with each other in a direction longitudinally of said drum,

(f) transverse aligned openings through said legs of each said clevis member adapted to move into alignment with adjacent aligned openings through said walls of said tubular member,

(g) a rod-like member extending longitudinally and inwardly of the inner surface of said drum and through said transverse aligned openings through said clevis members and said tubular members in each said row of openings in said drum to secure each said clevis member to its tubular member, and

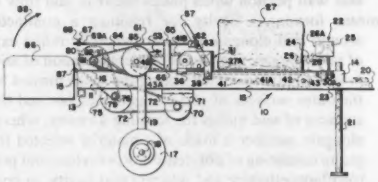
(h) means to attach the inner end of a flail member to each said clevis member.

4,222,419

LOG SPLITTER

David P. Oliver, Winnipeg, Canada, assignor to Oliver Design Specialties Ltd., Winnipeg, Canada

Filed Mar. 8, 1979, Ser. No. 18,523
Int. Cl.[3] B27L 7/00
U.S. Cl. 144—193 R **27 Claims**



1. A log splitting assembly having a source of power and comprising in combination

a frame including a track component mounted thereon,

a fixed wedge assembly on one end of said track component,

a ram carriage on said track component,

means mounting said ram carriage for sliding movement along said track component in either direction,

an endless chain mounted within said frame and being operatively connected to the source of power,

means in said frame mounting said endless chain for movement by said source of power,

sprocket means mounted for rotation in said ram carriage, said endless chain engaging around said sprocket means, said carriage being movable from a free wheeling mode to a chain connected mode and vice versa,

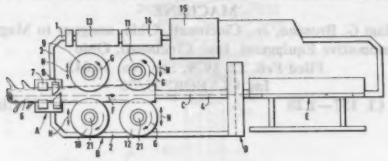
and means co-operating with said carriage to change said carriage from said free wheeling mode to said chain connected mode and vice versa, said carriage, when in said free wheeling mode, being movable manually in either direction along said track component and being operatively fixed to said chain for movement therealong said track component, when in said chain connected mode.

4,222,420

DEVICE FOR FEEDING LOGS

Börje Karlsson, S-360 40 Rottne, Sweden

Filed Feb. 7, 1978, Ser. No. 875,756
Claims priority, application Sweden, Feb. 9, 1977, 7701415
Int. Cl.[3] B27B *31/00*
U.S. Cl. 144—246 A 10 Claims



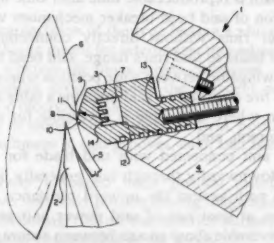
1. A device for feeding logs, comprising:
(a) means forming a horizontal support bed for defining a log feed path;
(b) at least one pair of elastically resilient feed wheels mounted for rotation about respective generally vertical axes located at opposing sides of the feed path, the axes being movable toward the feed path for resiliently engaging a log and movable away from the feed path to permit a log to be placed in the feed path;
(c) means for driving the feed wheels rotatingly about their respective axes;
(d) at least one feed wheel having a resilient upper sidewall, a resilient lower sidewall, and a resilient log feeding surface connecting the upper and lower sidewalls, the log feeding surface conforming generally to the shape of a log being fed when pressed against the log;
(e) said at least one feed wheel further having means for reinforcing an upper portion thereof, said upper portion comprising at least said upper sidewall, such that, when said at least one feed wheel is moved toward the feed path for resiliently engaging a log to be fed, a portion of the log feeding surface thereof near the lower sidewall flexes radially inwardly to a greater extent than does a portion of the log feeding surface thereof near the upper sidewall;
(f) whereby as the log is fed along the feed path by the feed wheels, said at least one feed wheel exerts a component of force on the log in a downward direction, thereby preventing the log from slipping upwardly and out of contact with the log feeding surface of the feed wheels.

4,222,421

PRESSURE BAR FOR VENEER CUTTING

Donald C. Walser, Surrey, and Thomas A. McLauchlan, Vancouver, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jun. 27, 1978, Ser. No. 919,464
Int. Cl.[3] B27C *7/00*
U.S. Cl. 144—325 1 Claim



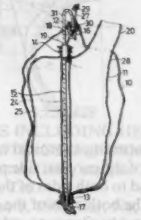
1. In a system for cutting veneer using a fixed pressure bar, the improvement comprising heating the wood contacting surface of the pressure bar to a temperature of from 70° to 250° C. to reduce the frictional drag on the wood.

4,222,422

PLIANT MATERIAL CONTAINER

Gustaf G. Löfberg, Landskrona, Sweden, assignor to Supra Aktiebolag, Landskrona, Sweden

Filed Jun. 5, 1979, Ser. No. 45,696
Claims priority, application Sweden, Jul. 11, 1978, 7807730
Int. Cl.[3] B65D *33/14*
U.S. Cl. 150—1 10 Claims



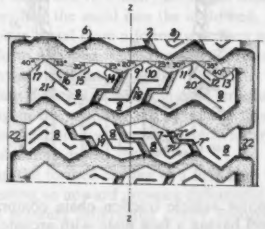
1. A container, comprising an inner casing and an outer casing which encloses said inner casing, wherein an elongate member extends through a container space formed by the interior of said inner casing and is secured to an upper portion and a lower portion of the container, of which casings at least the inner casing comprises a pliant material, and wherein the elongate member at said upper portion is secured solely to the outer casing, and the upper portion of the inner casing is displaceable along the elongate member.

4,222,423

PNEUMATIC TIRE TREAD

Philippe Jamain, Chatel-Guyon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 8, 1978, Ser. No. 967,597
Claims priority, application France, Dec. 16, 1977, 77 38560
Int. Cl.[2] R60C *11/08*
U.S. Cl. 152—209 R 4 Claims



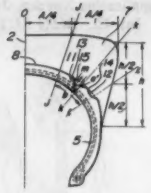
1. A pneumatic tire for use on snow covered roads, comprising a radial carcass reinforcement, a tread reinforcement comprising at least two superimposed crossed plies of wires or cables parallel to each other in each ply, a tread having substantially transverse rows of blocks which are interlaced and the substantially transverse ridges of which have a broken line trace, characterized by the fact that at least most of the segments of the substantially transverse ridges have an inclination which increases progressively, with respect to the transverse direction, from the center line of the tread towards each of the edges thereof.

4,222,424

LUG TIRES WITH UNIFORM BASE RUBBER GAUGE

Junichi Tsuzura, Urawa, and Yukio Kojima, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 970,076
Claims priority, application Japan, Dec. 28, 1977, 52-157440
Int. Cl.[2] B60C *11/00, 13/00*; B29H *5/02, 17/02*
U.S. Cl. 152—209 B **6 Claims**



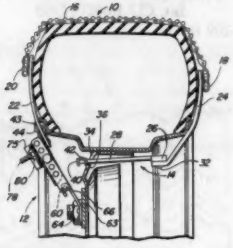
1. In a lug tire comprising a toroidal carcass, a tread disposed on a crown portion of the carcass, side portions extending from both ends of the tread to both sides of the tire and a pair of bead portions located at the both ends of the side portions, the tread being composed of rubber lugs spaced apart from each other by a given distance in the circumferential direction of the tire and a base rubber interposed between the rubber lugs, any two adjacent lugs being inclined in opposite directions with respect to the equatorial plane of the tire, the improvement comprising at least one discontinuous portion formed during the molding of the tire by decreasing the thickness of said base rubber at both end regions of said tread and arranged along the circumferential direction of the tire, said discontinuous portion having a depth which is in the range of 25% to 80% of a design base rubber gauge whereby the base rubber is otherwise of a substantially uniform gauge.

4,222,425

TIRE TRACTION CHAIN

Paul H. Bindel, 3946 W. North Ave., Chicago, Ill. 60647

Filed Aug. 15, 1979, Ser. No. 66,633
Int. Cl.[3] B60C *27/02*
U.S. Cl. 152—234 **5 Claims**



1. In a motor vehicle traction chain comprising a motor vehicle wheel having a face plate with arcuate cutouts adjacent the periphery, including a tire and wheel lugs, in combination:

(a) tread chains having sprocket chains on the free ends of said tread chain;

(b) a pair of front and rear clamping members each removably attached to the face plate of the vehicle wheel;

(c) front and rear elongated strips of leather-like material secured at one end to one of each of said sprocket chains;

(d) an elongated plate secured to the end of said rear material, said plate being inserted in and through one of said arcuate cutouts from the rear of said face plate;

(e) U-shaped channel secured transversely of and medially to said elongated plate against the face of the face plate to form the rear clamping member; and

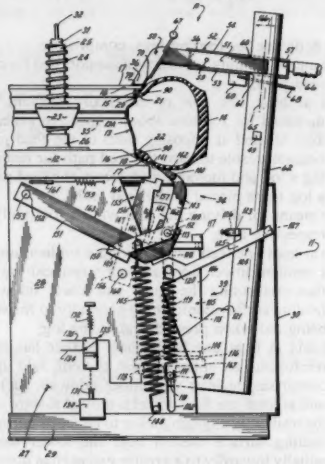
(f) the front clamping member anchored to a wheel lug.

4,222,426

BEAD BREAKER MECHANISM FOR A TIRE CHANGER MACHINE

William G. Brosene, Jr., Cincinnati, Ohio, assignor to Magnum Automotive Equipment, Inc., Cincinnati, Ohio

Filed Feb. 22, 1979, Ser. No. 14,042
Int. Cl.[3] B60C *25/06*
U.S. Cl. 157—1.28 **17 Claims**



1. An improved bead breaker mechanism for a tire changer machine, said bead breaker mechanism being adapted to break a tire's bead away from a rim's bead seat when said rim and tire are positioned on said machine's table, said mechanism comprising

a bead breaker blade which moves in a generally linear and radially inward direction during use from a set-up position in contact with said rim's flange where said blade rests on a tire's bead area toward the rim's center plane to a maximum extension position where said blade's working face is entirely located radially inward of said rim's flange, said blade's rim edge clearing said rim's base in its radially inward path by a distance at least equal to the diameter of said tire's bead core, which generally linear radially inward path is reproduceable time after time upon repeated operation of said bead breaker mechanism with different diameter rims without directly connecting said bead breaker blade to said rim's flange, said bead breaker blade being swingable between a use position where it can be set upon a tire disposed on said machine's table and a storage position where said table is accessible for changing the tires thereon, and

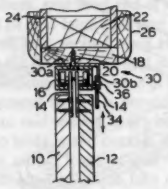
a power unit connected with said blade for moving said blade downwardly through said generally linear radially inward path against the upward resistance provided by said tire, at least one of said power unit and said blade being pivotable about an axis between a storage position at which said blade is out of operational relation with said tire and a use position at which said blade is swung into operational relation with said tire.

4,222,427

TRIM UNITS FOR VALANCES, DOORS AND THE LIKE

John Buchner, Burlington, Canada

Filed Feb. 21, 1978, Ser. No. 879,706
Int. Cl.[2] E06B 9/00
U.S. Cl. 160—19 13 Claims



1. A trim unit for valances, doors and the like for mounting on a building structure, the unit comprising:

a unitary elongated base trim member having a first horizontal member adapted to be mounted on a generally horizontal surface of the building structure for support of the base member and to extend across the doors and the like; and having a second, vertical member depending from the base member to extend downwards from the base member when the unit is mounted on the building structure and having a front surface constituting a part of the trim surface of the trim unit as a whole; and

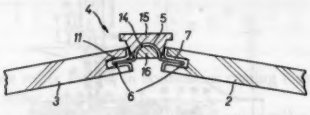
an elongated, unitary supplementary trim member mounted on the said second vertical member and having a front surface to constitute an additional front trim surface of the unit as a whole, and of generally similar length to said base trim member and mounted for vertical movement when the unit is mounted on the building structure to expose the required amount of front trim surface of the base trim member and thereby to adjust the vertical height of the combined front trim surfaces of the vertical and supplementary members.

4,222,428

FOLDING PARTITION

Anton Scherer, Sengenthalstrasse 472, Gretzenbach, Schweiz, Switzerland

Filed Feb. 22, 1978, Ser. No. 880,165
Claims priority, application Sweden, Mar. 8, 1977, 772903
Int. Cl.[2] E06B 3/12, 9/00
U.S. Cl. 160—231 R 1 Claim



1. A folding partition of the type having a plurality of panel sections and hinge means for interconnecting adjacent edges of the sections wherein the hinge means comprises

means defining grooves along the adjacent panel section edges for receiving fasteners;

a plurality of elongated fasteners for firm, positive insertion and attachment in said grooves, each said fastener including

a generally U-shaped body portion insertable into a groove, said body portion having longitudinally extending anchoring ribs on the exterior surface thereof for frictional engagement in the groove,

an interior slot, said slot terminating at its inner end in an enlarged cavity, and

flange means laterally extending from said body portion for completely covering the faces of the panel edge adjacent the groove therein;

an elongated hinge member comprising a woven fabric band having longitudinally extending holding ribs along opposite edges thereof, said holding ribs being dimensioned to be received in said cavities in fasteners inserted into grooves in adjacent panel edges; and

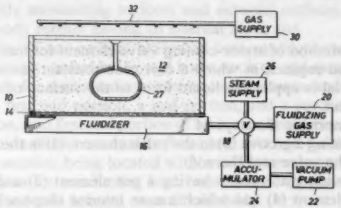
profiling strips for covering a portion of the band between said edges including a concave strip and a mating convex strip with said middle portion of said band being adhered to and held between said strips.

4,222,429

FOUNDRY PROCESS INCLUDING HEAT TREATING OF PRODUCED CASTINGS IN FORMATION SAND

Willard E. Kemp, Houston, Tex., assignor to Foundry Management, Inc., Houston, Tex.

Filed Jun. 5, 1979, Ser. No. 45,841
Int. Cl.[2] B22D 27/04, 27/16; C21D 9/00
U.S. Cl. 164—34 28 Claims



1. The foundry process, which comprises the steps of producing a thin shell, slightly porous mold,

fluidizing a mold bed of granular material and setting the thin shell mold therein,

said fluidizing being created by a pressure differential upward through the bed,

discontinuing the fluidizing step to permit the granular material of the mold bed to solidify about the thin shell mold, thereby settling the mold into the mold bed,

pouring molten metal from a foundry furnace into the shell mold to form a casting while creating a pressure differential downward through the bed,

the pressure differential assuring mold structure integrity, assisting in the uniform and complete flow of molten metal in the mold and causing the downward extraction of combustible gases,

heat treating the formed casting at a first high temperature while creating an upward pressure differential through the bed, said pressure differential gently fluidizing the bed, thereby uniformly heat treating the casting,

cooling said bed while creating an upward pressure differential through the bed using ordinary air,

thereby heat treating the formed casting at a lower temperature than said first temperature,

heat treating the formed casting at a second high temperature lower than the first high temperature while again gently fluidizing the bed around the casting by creating an upward pressure differential through the bed,

cooling the casting to about room temperature, and

gently fluidizing the bed of granular material and removing the casting.

4,222,430

METHOD OF ARMO-COATING VALVE SEATS OF INTERNAL COMBUSTION ENGINES

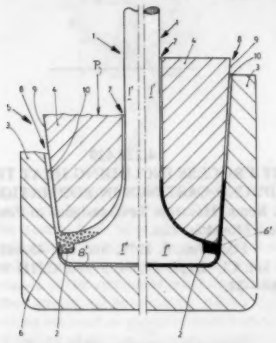
Horst Lindner, Königsbrunn, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 17,045

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809384

Int. Cl.³ B22D *19/02, 19/08*

U.S. Cl. 164—61 **6 Claims**



1. Method of armor-coating valve element for internal combustion engines, in which a corrosion-resistant armor-coating material is applied in liquid form to the surface of the valve element

comprising the steps of

forming a groove (2) in the valve element (1) in the region of the valve seat thereof;

providing a crucible having a pot element (3) and a cover element (4) and which has an interior shape which conforms to the outer shape of the valve element, when coated;

introducing the valve element (1) in the pot element (3); introducing armor-coating material in granular form in the space formed by the groove within the crucible;

positioning the cover element (4) of the crucible in freely movable in-out relation with respect to the pot element thereof;

heating the assembly of the crucible (3, 4; 5), the valve element (1) therein, and the granular armor-coating material (6), under vacuum, to liquefaction temperature of the armor-coating material, the armor-coating material, upon liquefaction, filling the space between the valve element and the interior surfaces of the crucible and rising in gaps formed between the cover element (4) and the pot element (3) and the valve element (1), respectively, and filling the groove (2) in the valve element.

4,222,431

CONTINUOUS CASTING WITH RESILIENT STRIP-EDGE GRIPPING MEANS

Neil B. Bryson, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

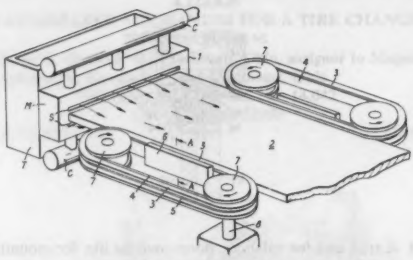
Filed Jun. 26, 1978, Ser. No. 919,314

Claims priority, application United Kingdom, Jul. 4, 1977, 27907/77

Int. Cl.³ B22D *11/128*

U.S. Cl. 164—89 **10 Claims**

1. A method for continuously casting metal in the form of a strip of a thickness in the range of 5 to 30 mm which comprises supplying molten metal to a fixed open ended casting mould having an essentially rectangular passage therethrough, such passage having a minimum transverse dimension in the range of 5 to 30 mm, withdrawing metal strip continuously from the exit end of said casting mould passage, applying liquid coolant to at least the broad faces of the metal strip issuing from said mould passage at a location adjacent to the mould exit, the withdrawal of the cast strip from the mould passage being



effected at least primarily by pressing resilient gripping means against the opposed side edges of the emerging cast strip at locations proximate the mould exit and progressing the gripping means at opposed side edges in parallel paths which maintaining pressure against the side edges of the strip.

4,222,432

ARRANGEMENT FOR SEPARATING THE STARTER BAR FROM THE HOT STRAND IN THE STRAND GUIDEWAY OF A CONTINUOUS CASTING PLANT

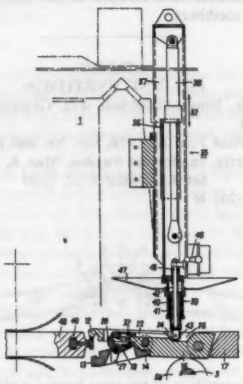
Werner Scheurecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 19, 1979, Ser. No. 59,067

Claims priority, application Austria, Aug. 4, 1978, 5670/78

Int. Cl.³ B22D *11/08*

U.S. Cl. 164—446 **8 Claims**



1. In an arrangement for separating a starter bar from a hot strand in a continuous casting plant strand guideway, including a starter bar head designed like a pair of tongs having a first tong cheek and a second tong cheek, said first and said second tong cheeks being lockable in a tong closing position, an opening mechanism being provided for releasing said first tong cheek from said second tong cheek, the improvement which is characterized in that

a latch having a hook end is pivotably mounted on said first tong cheek and an extension is provided on said second tong cheek, said latch being movable between a holding position in which it overlaps said extension with its hook end and holds said first and said second tong cheeks in a

closing position, and a release position in which it releases said extension of said second tong cheek,

a bolt having a head end and a foot end is mounted in said second tong cheek so as to be displaceable in approximately the axial direction of said starter bar, said starter bar having a foot part and said starter bar head including a second tong cheek recess open towards a side face of said second tong cheek, said head end of said bolt contacting said hook end of said latch and said foot end of said bolt projecting into said second tong cheek recess in a direction towards the foot part of said starter bar,

a switch member is stationarily mounted at the strand guideway and an adjustment device is provided to move said switch member into said second tong cheek recess of said starter bar head, to bring it into contact with said foot end of said bolt and to retract it out of said recess,

a latch projection directed to a side face of said first tong cheek is provided, said first tong cheek including a first tong cheek recess, in said holding position of said latch said latch projection comes to lie within said first tong cheek recess, while in said release position of said latch, said latch projection comes to lie in a position projecting beyond the side face of said first tong cheek, and

a counter stop coacting with said latch projection is provided at said strand guideway, said latch being movable into said holding position by the pivoting back of said latch projection into the first tong cheek recess by means of said counter stop.

4,222,433

GUIDE ROLLER FOR CONTINUOUS CASTING INSTALLATIONS

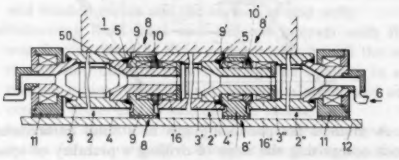
Heinrich Marti, Forch, and Friedrich Flückiger, Einsiedeln, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Continuation of Ser. No. 831,688, Sep. 8, 1977, abandoned. This application Jul. 2, 1979, Ser. No. 53,792

Claims priority, application Switzerland, Sep. 24, 1976, 12114/76

Int. Cl.³ B22D *11/12*

U.S. Cl. 164—448 **5 Claims**



1. A guide roller for use in continuous casting installations, said guide roller comprising:

a plurality of interconnected individual guide roller sections;

at least one of said guide roller sections having a plug means fixedly connected to one end of said guide roller section for interconnecting two neighboring roller sections with one another; said plug means being provided with a support bearing for supporting said guide roller section and for allowing rotation of said plug means relative to a bearing holder;

at least one guide roller section being shaped at one end thereof to define a complimentary recess receiving an associated plug means of a neighboring guide roller section; each guide roller section having a roller shell; and

further bearing means for enabling lengthwise expansion of a related roller section provided between the plug means and the roller shell of the related neighboring roller section and for enabling relative movement of each roller section with respect to each other.

4,222,434

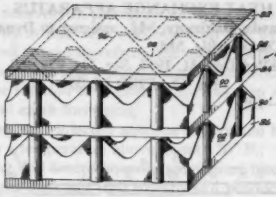
CERAMIC SPONGE HEAT-EXCHANGER MEMBER

Robert A. Clyde, P.O. Box 430820, South Miami, Fla. 33143

Continuation-in-part of Ser. No. 870,030, Jan. 16, 1978, abandoned. This application Apr. 27, 1978, Ser. No. 900,513

Int. Cl.³ F28F *21/04*

U.S. Cl. 165—10 **22 Claims**



1. A heat exchanger for use in high temperature environments comprising:

a body of non-resilant ceramic sponge comprising randomly located and interconnecting walls bounding a plurality of randomly located interconnected cavities, said cavities of said ceramic sponge representing substantially more volume than said interconnecting walls, said body defining external surfaces, said external surfaces having a sharp and rough texture resulting from said interconnecting walls abruptly terminating to form said external surfaces, and said body further having an internal zone; and

a plurality of non-resilant elongated heat-conductive members snugly embedded in said body, each of said members suitable for withstanding extreme temperatures, and having a first end portion, a mid-portion, and a second end portion, said first end portion of each member intersecting a portion of said external surfaces, and said mid-portion of each member being located within said internal zone, said members for conducting heat between said external surfaces and said internal zone of said body.

4,222,435

AIR CONDITIONING DISPLAY SYSTEM FOR VEHICLES

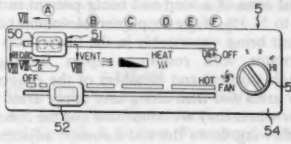
Naotake Kumagai, Aichiken, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,610

Claims priority, application Japan, Apr. 19, 1977, 52/49353[U]; Mar. 3, 1978, 53/24684

Int. Cl.³ F28F *27/00*; B60H *1/00*; B60Q *11/00*; G08B *5/36*

U.S. Cl. 165—11 R **26 Claims**



1. An air conditioning display system for a vehicle comprising a vehicle's air conditioner proper including at least a plurality of air intake ducts, a plurality of air discharge ducts, a plurality of dampers disposed in said ducts for closing and opening said ducts, a fan unit, and a heat exchanger, air conditioner actuating means for actuating at least said dampers and said fan unit in said air conditioner proper and controlling supply of heat medium to said heat exchanger, and a display device including at least temperature sensing means for sensing a temperature at said heat exchanger, and display means for providing display corresponding to the temperature at said heat exchanger in response to a signal from said temperature sensing means;

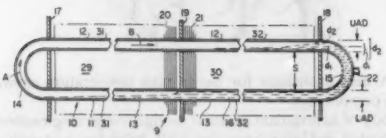
said display means energizing lighting means to provide the temperature display; and said display means is disposed in a knob located at one end of a function lever provided in said air conditioning actuating means for moving said dampers.

4,222,436

HEAT EXCHANGE APPARATUS

Milton F. Pravda, Baltimore, Md., assignor to Dynatherm Corporation, Cockeysville, Md.

Filed Dec. 21, 1978, Ser. No. 971,849
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—105 **3 Claims**



1. In a bidirectional heat exchanger device for adjusting the air temperature in a first space by adding thereto air at a different temperature from a second space, wherein a first airway and a second airway are present for transferring air therethrough, means for keeping said airways separate, wherein working agent-containing heat exchange elements extend into and between said airways for transporting heat from the air in one airway to that in another, said elements each comprising an evaporator portion in one airway for receiving heat from heated air passing thereover and a condenser portion in the other airway for giving up heat to air passing thereover, and wherein said elements have a horizontal orientation which is difficult to establish and/or maintain and is subject to change during construction, installation, and/or operation of the device to produce unavoidable, accidental, and/or initially undetected adverse tilts, said adverse tilts being characterized by having said evaporator disposed above the level of the condenser and being of a magnitude as to reduce or even shut off the heat transport capability of the device,

the improvement wherein each element is a tube in the form of a closed, substantially horizontally disposed, evacuated, hermetically sealed loop comprising a pair of arms connected to each other at their ends by a pair of end members, one arm being disposed above the other such that a plane passing through longitudinal center lines of both arms makes an angle with the horizontal which is in the range of 15° to 165°, and said arms of each loop being spaced apart a distance of 1 to 25 arm diameters,

said working agent initially being disposed only in the lower of said arms of a loop and being present in the range of 34% to 51.3% of the loop internal volume,

said agent being vaporizable in the lower loop arms of the evaporator with resulting vapors flowing upwardly through adjacent end members of the evaporator to the upper arms and then along said upper arms to said condenser where they are condensed and the condensed agent then flowing down the end members adjacent thereto to the lower loop arms of the condenser and back to the evaporator, said agent in the form of vapor and condensate flowing cocurrently through said loops in the same direction,

each said loop having a liquid driving head for effecting heat transport which is in the range of 2.5 to 27 times the diameter of a loop arm and which is in the range of 2.5 to 27 times greater than the driving head of a conventional Perkins tube element, the diameters of the Perkins tube and the loop tube being the same,

said liquid driving head being reinforced by the action of the vapor flow which is cocurrent with the liquid flow, thereby to produce a combined driving head that is additionally greater than that of said Perkins tube which has a countercurrent vapor/liquid flow in which vapor shear reduces the liquid head by acting against the same,

each said loop in heat exchange operation being characterized by (1) transporting a substantially greater amount of thermal energy than a conventional Perkins tube under comparable conditions, by (2) transporting said greater amount of thermal energy, without burnout, at an adverse tilt of about 1 inch, thus exhibiting insensitivity to said tilt, whereas said Perkins tube under comparable conditions exhibits burnout at a substantially lower adverse tilt and at a substantially lower thermal energy transport level, and by (3) transporting more than twice the power, without burnout, than a conventional Perkins tube under comparable conditions,

said device being free of tilt-producing and/or tilt-changing mechanism while coincidently exhibiting an efficiency which is substantially insensitive to an adverse tilt of one inch and which is greater than 50% in the presence of an adverse tilt of 1 to 2 inches,

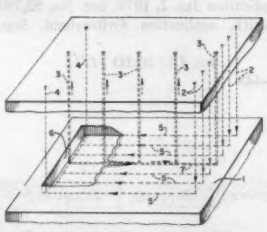
and said device, throughout bidirectional operation of the same, and by virtue of said insensitivity to adverse tilts, being rigidly attachable in place and to said airways, said attachment aiding the passive operational quality of the device.

4,222,437

METHOD FOR IN SITU GAS PRODUCTION FROM COAL SEAMS

Karol Sabol, 3116 - 67A St., Edmonton, Alberta, Canada

Filed May 14, 1979, Ser. No. 38,949
Claims priority, application Canada, May 15, 1978, 303287
Int. Cl.² E21B *43/24*
U.S. Cl. 166—245 **5 Claims**

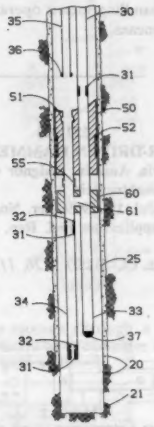


1. A method for producing gas in a solid carbonaceous deposit comprising the steps of drilling a plurality of spaced apart supply wells in a line at one location in the deposit for receiving a combustion supporting gas; cutting a substantially horizontal supply passage at the bottom end of each said supply well extending through the deposit away from said well; drilling auxiliary wells at other locations in said deposit remote from said supply wells and communicating with selected of said supply passages; cutting a channel between the bottom ends of said auxiliary wells to interconnect the ends of said supply passages remote from said supply wells; drilling a row of gas production wells substantially perpendicular to said line of supply wells and communicating with a discharge passage extending from said channel to said line of supply wells, said discharge passage being substantially parallel to and in the same horizontal plane as said supply passages; igniting the carbonaceous deposit in said channel to create a combustion zone; continuously removing gases produced in said combustion zone via said discharge passage and at least one of said production wells while maintaining combustion in said combustion zone by feeding combustion supporting gas thereto via said supply wells and said supply passages.

4,222,438
RESERVOIR FLUID SAMPLING METHOD AND APPARATUS

Frank H. Hollingsworth, and Lawrence N. Mower, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 30, 1978, Ser. No. 955,848
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—250 6 Claims



1. A method of determining conditions in a fluid-containing well which penetrates a fluid-producing interval, which comprises

extending conduit means from the top of said well to a location in said well above and adjacent at least a portion of said fluid-producing interval for providing communication between the top of said well and the interior of said well at said location;

isolating at least a portion of said fluid-producing interval in said well with packer means above and adjacent the lower end of said conduit means for sealing the annulus between said conduit means and the surface of said well;

withdrawing fluid from said isolated interval with fluid transferring means in fluid communication with the interior of said conduit means through an opening in said conduit means, wherein said opening is above and adjacent the lower end of said conduit means; and

determining conditions in said isolated interval by lowering means for determining said conditions through said conduit means to a location in said interval below said opening.

4. Apparatus for determining conditions in a fluid-containing well penetrating a fluid-producing interval, which comprises:

conduit means extending from the top of said well to a location in said well above and adjacent at least a portion of said fluid-producing interval for providing communication between the top of said well and the interior of said well at said location,

packer means above and adjacent the lower end of said conduit means for sealing the annulus between said conduit means and the surface of said well,

fluid transferring means in fluid communication with the interior of said conduit means through an opening in said conduit means for withdrawing fluids from said conduit means, wherein said opening is above and adjacent the lower end of said conduit means; and

means lowered through said conduit means to a location below said opening for determining conditions in said well.

4,222,439
ENHANCED RECOVERY OF PETROLEUM

John H. Estes, Wappingers Falls, and Ernest P. Buinicky, Newburgh, both of N.Y., assignors to Texaco Inc., White Plains, N.J.

Filed Aug. 7, 1978, Ser. No. 931,693
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 11 Claims

1. In the recovery of petroleum oil from an earth formation penetrated by at least one injection well and by at least one recovery well spaced therefrom, the method which comprises:

(a) injecting, via said injection well, an aqueous ammonium bisulfite solution of a temperature less than about 120° F. into said earth formation;

(b) heating said injected aqueous ammonium bisulfite solution to a temperature above about 120° F.;

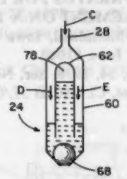
(c) driving said heated aqueous ammonium bisulfite solution from said injection well toward said production well for displacing petroleum oil from said earth formation; and

(d) producing said displaced petroleum oil from said recovery well.

4,222,440
METHODS OF SMALL VOLUME PUMPING ESPECIALLY SUITED FOR OIL RECOVERY FROM STRIPPER WELLS

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Nov. 27, 1978, Ser. No. 964,043
Int. Cl.[2] E21B *43/00*; F04F *1/06, 1/08*
U.S. Cl. 166—314 9 Claims



5. A pumping method comprising the steps of:

(a) collecting liquid via a pressure responsive valve means in a first closed housing submerged in said liquid;

(b) pressurizing said housing via a single passageway to close said pressure responsive valve means and to displace said liquid while it remains entrapped within said housing; and

(c) suddenly depressurizing said single passageway and said housing whereby said displaced liquid returns from said displacement with velocity and momentum which drives said liquid out of said single passageway.

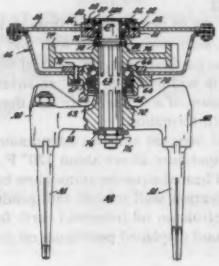
4,222,441
AGRICULTURAL IMPLEMENTS

Cornelis van der Lely, Zug, Switzerland; Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Division of Ser. No. 690,880, May 28, 1976, Pat. No. 4,124,078. This application Aug. 24, 1978, Ser. No. 936,362
Claims priority, application Netherlands, Jun. 2, 1975, 7506493; Jun. 12, 1975, 7506984
Int. Cl.[2] A01B *33/06*
U.S. Cl. 172—59 8 Claims

1. An agricultural implement comprising a frame and a plurality of soil working members journalled in a hollow transverse frame portion of said frame, said soil working members being rotatably mounted on corresponding upwardly extending shafts and each shaft being supported by said frame portion through at least one bearing connection, driving means engag-

ing said soil working members and said driving means comprising intermeshed pinion gears housed within said frame portion, said bearing connection including a bearing enclosed in a protective housing and said housing being secured in an opening of an upperwall of said frame portion, said housing comprising two separable portions that are connectable to one



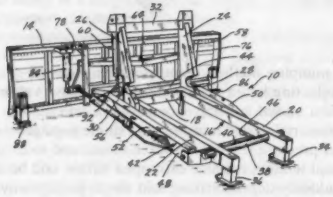
another and eveloping the bearing and secure same to said upper wall, said portions being positioned on and secured to opposite sides of said upper wall and the outer circumferential surface of said bearing being surrounded and and enclosed by at least one of said housing portions, at least one of said portions having an annular rim that fits within said opening said portions together enclosing and securing said bearing in place.

4,222,442

METHOD AND APPARATUS FOR POWER MOUNTING AN IMPLEMENT ON A TRACTOR

Neal W. Westendorf, Smithland, Iowa 51056, and Joseph W. Langenfeld, Onawa, Iowa 51040

Filed Dec. 14, 1978, Ser. No. 969,371
Int. Cl.[2] A01B *51/00*
U.S. Cl. 172—273 **12 Claims**



4. In combination,

a tractor having rearward and forward ends and a source of hydraulic power,

a pair of cylindrical members secured to and extending horizontally outwardly from opposite sides of the tractor adjacent the forward end thereof,

a pair of laterally spaced mounting means secured to said tractor rearwardly of said cylindrical members,

a first generally U-shaped and horizontally disposed frame means having rearward and forward ends comprising a laterally extending front frame member having side frame members secured to the opposite ends thereof and extending rearwardly therefrom,

first and second uprights secured to said first frame means adjacent the forward and thereof, each of said uprights having a rearwardly presented opening for removably receiving one of said cylindrical members,

said side frame members being operatively detachably secured to said mounting means,

a second generally U-shaped and horizontally disposed frame means having rearward and forward ends comprising a laterally extending front portion having side portions secured to opposite ends thereof and extending rearwardly therefrom,

the rearward ends of said side portions being pivotally secured to said side frame members rearwardly of the forward ends thereof,

a first hydraulic cylinder means operatively connected to said first and second frame means for raising and lowering said second frame means with respect to said first frame means,

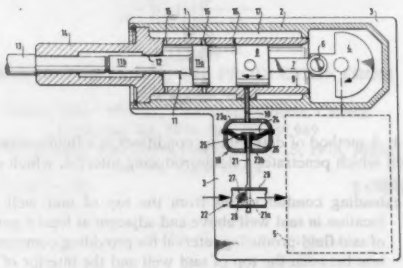
and a materials handling means operatively secured to said second frame means.

4,222,443

MOTOR-DRIVEN HAMMER DRILL

Franz Chromy, Levis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 19, 1979, Ser. No. 58,839
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832169
Int. Cl.[2] B25D *9/26, 11/12*
U.S. Cl. 173—116 **8 Claims**



1. Hammer drill comprising an axially elongated cylinder having a first end and a second end, a drive piston located within said cylinder and located adjacent the first end thereof, a drive motor, means connected to said drive motor and said drive piston for reciprocating said drive piston back and forth in said cylinder, a percussion piston located within said cylinder in spaced relation with said drive piston and located between the second end of said cylinder and said drive piston, a tool holder connected to said cylinder for holding a tool to be driven by said percussion piston, said drive piston and percussion piston forming a pneumatic buffer therebetween when a tool is placed in said tool holder and said drive piston is driven by said drive motor, wherein the improvement comprises first means for controlling the operation of said drive motor, and second means in communication with the pneumatic buffer and connected to said first means for regulating said first means based on the pressure conditions existing in the pneumatic buffer.

4,222,444

METHOD OF WELL FLUID LEAK PREVENTION

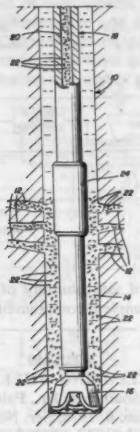
Harold L. Hamilton, 1215 Loving Rd., Graham, Tex. 76046

Filed Dec. 6, 1978, Ser. No. 967,704
Int. Cl.[2] E21B *33/138, 47/10*
U.S. Cl. 175—72 **5 Claims**

1. The method of well fluid leak prevention comprising the steps of

(1) admixing with a well drilling fluid, a substantial quantity

of insoluble polyester film having a magnetic coating sensible by a well logging device, and



(2) circulating the mixture through a well bore thereby allowing the particles to accumulate in the porous openings of the bore hole wall.

4,222,445

REDUCTION UNIT OF DRILLING MOTOR

Jury V. Vadetsky, shosse Kosmonavtov, 131, kv. 31; Nikolai D. Derkach, ulitsa Samoletnaya, 56, kv. 24; Ernst N. Krutik, ulitsa Komissara Pozharskogo, 10, kv. 93; Georgy F. Chudakov, ulitsa Odoevskogo, 28, kv. 9; Nikolai P. Stroitelev, ulitsa Stakhanovskaya, 15, kv. 11, all of Perm; Alexandr P. Natarov, ulitsa akademika Pavlova, 130, kv. 38, Kharkov; Jury S. Vasiliev, Chernomorsky bulvar, 5, korpus 3, kv. 239, Moscow; Vladimir N. Andoskin, ulitsa Cherdynskaya, 22, kv. 216, Perm, and Evgeny I. Ivanov, 2 Setunsky proezd, 4, kv. 150, Moscow, all of U.S.S.R.

Filed Jan. 8, 1979, Ser. No. 1,416

Int. Cl.² E21B *3/08*

U.S. Cl. 175—106 **17 Claims**

1. A reduction unit of a drilling motor installed between the working tool assembly and the drilling motor supporting assembly, comprising: a casing; adapter sleeves for connecting said casing with the housings of the working tool assembly and supporting assembly; a reduction gear with sun and crown wheels, pinion carriers and planet pinions with supports located in a circular space between the wheels; an overload safeguard preventing overloading of the reduction gear; a torque stabilizer eliminating the effect of torque fluctuations on operation of the reduction gear; input and output shafts of the reduction unit intended to transmit torque from the shaft of the working tool assembly to the reduction gear and from the reduction gear to the supporting assembly shaft; connecting elements in the form of couplings installed on said input and output shafts, intended to transmit torque and permitting relative axial displacements and axial misalignment of the connected shafts; supports of said input and output shafts installed on the ends of said shafts connected with the reduction gear and made in the form of an articulated unit taking axial loads and permitting angular displacements of the shafts; an oil-filled chamber accommodating said reduction gear, the overload safeguard of the reduction gear, the torque stabilizer thereof and the shaft supports, said chamber being secured on said casing so that the external surface of said chamber forms, together with the internal surface of the casing, a circular channel for the drilling fluid; and an oil protection system with seals installed on each of said input and output shafts side by side with their supports at the side opposite to the reduction gear, the seals incorporating dividing spaces filled with a buffer fluid which protects said seals from contact with the drilling fluid.

4,222,446

CUTTER WITH CUTTER HOLDER FOR DISINTEGRATING OF MATERIAL, PARTICULARLY OF ROCK

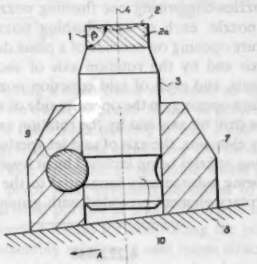
Jaroslav Vasek, Frydek-Mistek, Czechoslovakia, assignor to Vedecko vyzkumny uhelny ustav, Ostrava Radvanice, Czechoslovakia

Filed Nov. 28, 1978, Ser. No. 964,360

Claims priority, application Czechoslovakia, Nov. 29, 1977, 7874-77

Int. Cl.² E21B *9/00*

U.S. Cl. 175—329 **8 Claims**



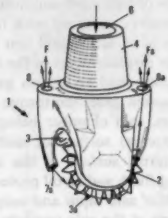
1. A mining cutter bit and holder assembly comprising a cutter element for use in a mining tool for disintegrating rock and the like having a carrier on which a plurality of said assemblies are mounted to revolve about a common axis, comprising a cutter element secured at the end of a supporting shaft having a central longitudinal axis, said cutter element having a shape of a solid figure of rotation and being provided with a peripheral working surface and a frontal base, defining between them a cutting edge, the axial section of the peripheral surface forming with a plane passing through the cutting edge and perpendicular to the longitudinal axis an angle between 40°–120° and a holder mountable on the tool carrier, said holder having a recess the axis of which extends outwardly at an angle to the common axis of rotation, for receiving the shaft of the cutter element and means for retaining said shaft in said recess to permit rotation of said cutter element relative to said holder about the longitudinal axis of said shaft while preventing axial movement of said shaft therein.

4,222,447

DRILL BIT WITH SUCTION JETS

Henri Cholet, Le Pecq, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 21, 1978, Ser. No. 962,578
Claims priority, application France, Nov. 21, 1977, 77 35135
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—340 **10 Claims**



1. In a rotary drill bit comprising a body adapted to be connected to rotating means, said body having an internal recess for receiving drilling fluid under pressure and being provided with a plurality of arms, a rotary element provided with ground cutting means rotatably mounted on each of said arms, means for flushing the hole bottom with drilling fluid, said means for flushing the hole bottom with drilling fluid being connected to said recess and comprising flushing nozzles adapted to deliver fluid jets having a component oriented in the direction of advance of said drill bit, and eduction means, also connected to said recess, said eduction means comprising nozzles adapted to generate eduction jets for carrying away the ground cuttings, said eduction jets having a component in a direction opposite to the direction of advance of said drill bit,

the improvement wherein each of said rotary elements of said drill bit comprises a pair of nozzles, each of said pairs of nozzles comprising one flushing nozzle and one eduction nozzle, each of said flushing nozzles having a jet aperture opening on one side of a plane defined by the drill bit axis and by the rotation axis of each of said rotary elements, and each of said eduction nozzles having a jet aperture opening on the opposite side of said plane defined by the drill bit axis and by the rotation axis of each of said rotary elements, the axis of said jet aperture of each of said flushing nozzles being inclined by at least 20° to said plane and being substantially tangential to the outer surface of said rotary element provided with ground cutting means.

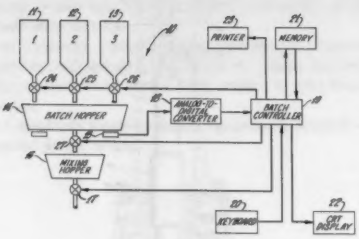
4,222,448

AUTOMATIC BATCH WEIGHING SYSTEM

Thomas H. Sunkle, Newark, and John M. Cox, Pataskala, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 29, 1979, Ser. No. 53,495
Int. Cl.[3] G01G *19/22, 13/02*
U.S. Cl. 177—1 **8 Claims**

1. A method of compounding a batch containing predetermined setpoint weights of each of a plurality of constituents comprising the steps of: initiating feeding of a first of said constituents into a batch receiver at a predetermined fast rate; periodically measuring the current weight of said first constituents accumulated in said batch receiver and calculating a feed rate for such constituent; slowing the feeding of such constituent to a predetermined slow rate when the sum of the current weight plus the product of the calculated fast feed rate times a fast feed response is at least equal to the setpoint weight for such constituent less a permissible tolerance and such setpoint weight; interrupting feeding of such constituent when the sum of the current weight plus the product of the calculated slow feed rate times a slow speed response is at least equal to the setpoint weight for such constituent less a permissible tolerance in such setpoint weight; and similarly successively feeding the remainder of said plurality of constituents into said batch receiver to complete compounding of a batch.

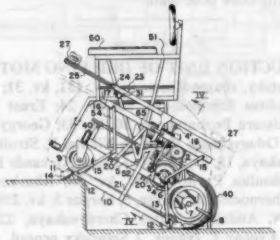


4,222,449

STEP-CLIMBING WHEEL CHAIR

Jack M. Feliz, 2110 Southridge Dr., Palm Springs, Calif. 92262

Filed Jun. 8, 1978, Ser. No. 913,549
Int. Cl.[2] A61G *5/04*
U.S. Cl. 180—8 A **6 Claims**



1. In a wheel chair for ascending and descending a step, curb or the like, the combination of:

a frame with castor wheels and drive wheels mounted thereon;

a pair of elongate substantially flat ramps;

a foldable, extendable and retractable ramp supporting assembly carrying said ramps and pivotally mounted on said frame;

a self-leveling seat pivotally mounted on said frame;

a first power drive means interconnecting said chair and frame and automatically energized to maintain the said seat in a level position regardless of an inclined position assumed by said frame;

a control means carried on said ramp supporting assembly for extending, positioning, retracting and folding said ramps relative to said frame for traverse by said castor and drive wheels; and

a second power drive means mounted on said frame and including a multi-speed transmission for driving said drive wheels on level terrain at conventional speeds and at a low speed with high torque up said ramps and functioning as a speed restraint while descending said ramp.

4,222,450

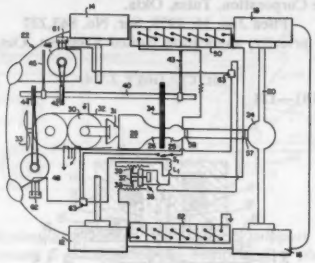
ELECTRICAL DRIVE FOR AUTOMOBILE

Hiram Fobbs, 240 State St., Westbury, Long Island, N.Y. 11590

Filed Apr. 13, 1978, Ser. No. 895,914
Int. Cl.[3] B60K *1/00, 25/02*
U.S. Cl. 180—65 D **3 Claims**

1. Apparatus for electrically driving an automobile compris-

ing: a DC motor, a transmission coupled to said DC motor and being operatively connected to a set of rear wheels; a drive shaft extending from said motor, a rear end differential operatively connected to a set of rear wheels, clutch means for coupling said rear end differential to said drive shaft, at least two storage batteries, an accelerator control circuit including means for varying the current flow from said batteries to said motor and means of activating said clutch means to disengage



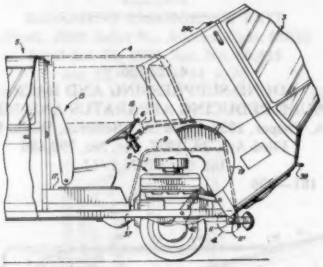
said rear end differential below a predetermined minimum acceleration and battery charging means comprising; an auxiliary shaft aligned in parallel with said drive shaft, means for coupling said auxiliary shaft to said drive shaft at a location between said clutch and said transmission such that said auxiliary shaft rotates in concert with said drive shaft and at least two alternators coupled to said auxiliary shaft and to said batteries for supplying recharging current during controlled periods of time when the rear wheels are disengaged.

4,222,451

TILTING CAB FOR VANS

Charles A. Lamb, 519 1/2 W. Thurber, Tucson, Ariz. 85705

Filed Oct. 23, 1978, Ser. No. 953,908
Int. Cl.[2] B62D *33/06*
U.S. Cl. 180—89.18 **6 Claims**



1. A van body for a van having a unitary interior volume including a rear compartment for cargo or passengers and a cab compartment for a driver, said van having an engine compartment housing an engine cover extending into said cab compartment and isolating said cab compartment from said engine compartment during normal operation of said van, said van body comprising in combination:

a. a rear body section containing said rear compartment, said rear body section being rigidly attached to a chassis frame of said van;

b. a cab section pivotable forward from a lowered position to a forward tilted position to expose the interior of said cab compartment and said engine compartment to facilitate engine maintenance and repairs and pivotable rearward from said forward tilted position to said lowered position to sealingly engage said rear body section;

c. pivot means attached to said chassis frame for pivotally connecting said cab to said chassis frame;

d. an engine cover connected to said cab section for isolating said engine compartment from said cab compartment when said cab section is in said lowered position and exposing said engine compartment to said cab compartment when said cab section is in said forward tilted position

e. fastening means for securely fastening said cab section to said main body section; and

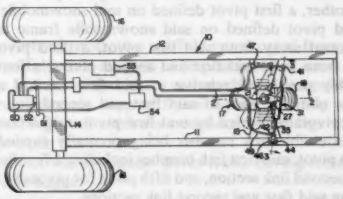
f. a first U-shaped brace attached to a forward portion of said main body section and a second U-shaped brace attached to a rearward portion of said cab section, said fastening means being operable to draw said second U-shaped brace against said first U-shaped base.

4,222,452

POWER STEERING MECHANISM FOR COTTON PICKERS

Robert M. Fachini, and William D. Lester, both of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 853,352, Nov. 21, 1977, abandoned.
This application Apr. 4, 1979, Ser. No. 27,185
Int. Cl.[3] B62D *5/06, 61/06*
U.S. Cl. 180—162 **3 Claims**



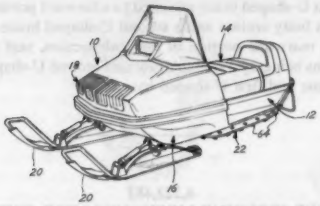
1. In a vehicle having a main frame structure, an operator's platform mounted forwardly on said frame structure and including an operator controlled steering wheel, a pair of laterally spaced front driving wheels supporting the forward portion of said main frame structure, a rear guide wheel assembly having a vertical pivot shaft pivotally mounted to a transversely central rearward portion of said main frame structure, and hydrostatic steering means for controlling the position of said guide wheel assembly relative to said frame structure, the improvement wherein said steering means comprises an actuating arm mounted on said pivot shaft for rotation therewith and extending radially therefrom to a bifurcated end, a double acting hydraulic cylinder assembly having a cylindrical housing, said housing having trunnions mounted intermediate the ends thereof on opposite sides thereof in axial alignment, said housing being pivotally mounted on a vertical axis by said trunnions between the bifurcated ends of said actuating arm, said cylinder assembly having a piston slideably mounted in said housing and a rod attached to said piston and extending from both sides thereof to ends external of said housing, one of said external ends of said rod being pivotally attached to said frame structure and the other end being free, said cylinder assembly further including end caps disposed in either end of said housing in sealing relationship with said rod, and a hydrostatic pump attached to and controlled by said operator controlled steering wheel, said hydrostatic pump being hydraulically connected to said hydraulic cylinder assembly and said cylinder assembly being mechanically independent of said pump and said steering wheel.

4,222,453

REAR SUSPENSION SYSTEM FOR A SNOWMOBILE

Hubert Fixsen, Willmar, and Roger Skime, Thief River Falls, both of Minn., assignors to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Nov. 17, 1978, Ser. No. 961,876
Int. Cl.[2] B62M *27/02*
U.S. Cl. 180—193 **21 Claims**



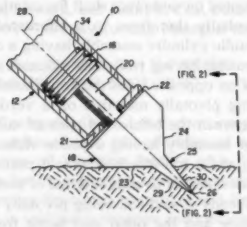
1. In a snowmobile having a frame, a drive belt assembly for propelling said snowmobile, said drive belt assembly including a suspension system for supporting said drive belt assembly on said frame, said suspension system being of the type which includes a front suspension section and a rear suspension section, an improved rear suspension section comprising, in combination, a first link member having a first end and a second end, a second link member having a first end and a second end, an extensible link member having a first end and a second end, said first and second link members being non-pivotal relative to each other, a first pivot defined on said snowmobile frame, a second pivot defined on said snowmobile frame and being positioned away from said first pivot, a third pivot spaced away from both said first and second pivots, a fourth pivot movably positioned relative to said first, second and third pivots, said first ends of said first and second link members being pivotally carried by said first pivot, said second end of said extensible link member being pivotally carried by said fourth pivot, said first link member including a first link section and a second link section, and fifth pivot for pivotally interconnecting said first and second link sections.

4,222,454

BIDIRECTIONAL GROUND COUPLING MEANS FOR INCLINED SEISMIC SOURCE

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 2, 1979, Ser. No. 307
Int. Cl.[3] G01V *1/04, 1/10*
U.S. Cl. 181—117 **7 Claims**



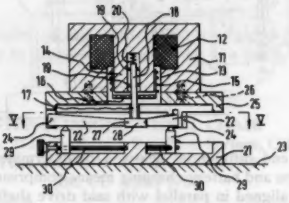
1. In apparatus for generating combined compressional and shear seismic waves in the earth including a seismic source adapted to direct a downward force along an axis inclined to the vertical, the improved means for coupling the energy of said source into the earth comprising a wedge-shaped ground contacting member having at least two opposed sides convergent symmetrically about said axis to an edge, either of said sides being adapted to rest on the earth's surface when said axis is so inclined.

4,222,455

VIBRATION GENERATORS

William E. Lerwill, Keston, England, assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed Jan. 16, 1978, Ser. No. 863,237
Claims priority, application United Kingdom, Oct. 4, 1977, 41239/77
Int. Cl.[3] G01V *1/14*
U.S. Cl. 181—121 **6 Claims**



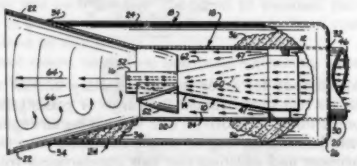
1. Apparatus for generating seismic vibrations in the ground comprising an electromagnet having a core with an air gap and a winding, a base adapted to rest on the ground to generate vibrations therein, an operating coil which is reciprocated in said gap by electromagnetic action with said electromagnet and means operatively connecting said core, said coil and said base, such that the ratio between the amplitudes of the movements of said coil relatively to said core and of said core relatively to said base is different from unity and is adjustable, said connecting means comprising a plurality of levers and means making pivotable connection between each of said levers, at points spaced along it, with said core, said coil and said base.

4,222,456

SOUND-SUPPRESSING AND BACK PRESSURE-REDUCING APPARATUS AND METHOD

Witold A. Kasper, 1853 132nd SE., Bellevue, Wash. 98005

Filed Apr. 25, 1977, Ser. No. 790,480
Int. Cl.[3] F01N *1/12*
U.S. Cl. 181—296 **3 Claims**



1. A method for controlling the flow of a flowing gas, said method comprising:

a. dividing said flowing gas into a first stream of gas and into a second stream of gas;

b. accelerating the first stream of gas to flow faster than said flowing gas;

c. decelerating the second stream of gas to flow slower than said flowing gas; and,

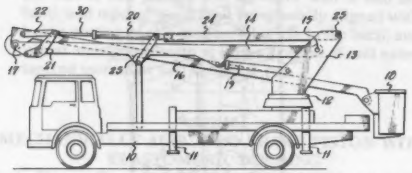
d. said first stream of gas flowing inside said second stream of gas.

4,222,457

HYDRAULIC PLATFORMS

Denis H. Ashworth, Wolverhampton, England, assignor to Simon Engineering Dudley Ltd., Dudley, England

Filed Mar. 19, 1979, Ser. No. 22,032
Claims priority, application United Kingdom, Mar. 29, 1978, 12328/78
Int. Cl.[2] B66F 11/04
U.S. Cl. 182—2 11 Claims



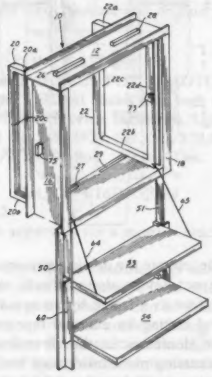
1. A hydraulic platform comprising a support structure which mounts a boom assembly comprising a plurality of booms pivotally connected in end-to-end relationship and carrying on its free end a working platform or cage, hydraulic actuator means for pivoting the booms relative to the supporting structure and one another to carry the working platform or cage to a variety of positions remote from the support structure and having a first boom pivotally connected to the support structure, a second boom pivotally connected to the free end of said first boom, first hydraulic cylinder means for effecting pivoting movement of said first boom relative to the support structure between a first inoperative position and a variety of operative positions, second hydraulic cylinder means connected with said second boom for effecting pivoting movement of said second boom relative to said first boom, said second hydraulic cylinder means being secured to a member which is pivotally connected with said support structure at a position offset from the pivotal connection between said first boom and said support structure.

4,222,458

BASEMENT EMERGENCY EXIT

James W. Pratt, 2080 Joliet St., Aurora, Colo. 80010

Filed Jul. 25, 1979, Ser. No. 60,415
Int. Cl.[3] E06C 1/34, 9/10
U.S. Cl. 182—81 12 Claims



1. An emergency basement exit opening to a ground level agress comprising,

a window having at least one sash hinged to swing outwardly providing exit for an adult,

a folding stairway secured adjacent said window providing accessability to said window in the down position and including a frame abutting the wall below said window and at least one tread pivoted along one edge mounted on said frame movable from a flush position with said frame to a perpendicular position therewith, and

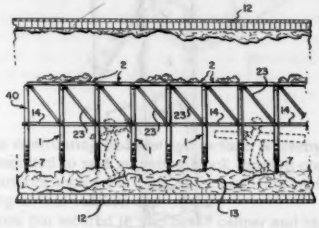
means interconnecting said at least one sash and said at least one tread constructed and arranged to open said hinged window when said at least one tread is pivoted to a perpendicular position with said frame.

4,222,459

PROTECTIVE SCAFFOLD

Thomas Hard, Ravena, and Ronald Swingle, Troy, both of N.Y., assignors to Atlantic Cement Company, Inc., Ravena, N.Y.

Filed Feb. 23, 1979, Ser. No. 14,713
Int. Cl.[2] E04G 1/34
U.S. Cl. 182—152 10 Claims



1. An overhead protective scaffold constructed from a plurality of scaffold units adapted to be positioned in series alignment, one in front of the other, with each unit comprising:

(a) a vertical main support frame having laterally spaced vertical legs and a crossbar connecting the legs at their upper ends;

(b) a protective rectangular cover frame having front, rear and side edges;

(c) hinge means pivotally connecting the rear edge of the cover frame to the crossbar of the main support frame for pivoting movement about the longitudinal axis of the crossbar from a storage position lying adjacent the plane of the main support frame to an erected overhead protective position extending horizontally when the main support frame is in a vertical position;

(d) first interconnecting means mounted on said crossbar for connecting the crossbar of the unit to the front edge of the cover frame of a previously erected unit; and

(e) a second interconnecting means attached to each of the legs of the unit for connection with the serially aligned legs of the next adjacent unit to maintain said legs of the units in fixed vertical position relative to each other.

4,222,460

EXTENSION LADDERS

Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling and Stamping Corp., Brooklyn, N.Y.

Filed May 14, 1979, Ser. No. 38,899
Int. Cl.[2] E06C 7/06, 1/12
U.S. Cl. 182—211 7 Claims

1. In an extension ladder having a bed section formed of a pair of parallel side rails and a plurality of equally spaced apart step members fixed transversly upon the side rails and a fly section formed of first and second parallel side rails and a plurality of transverse step members fixed upon the side rails spaced apart equivalent to the spacing of the step members of said bed section, the improvement which comprises:

a pair of automatic hook locks each comprising

a hook portion having a pivoted lower end and a

free upper end,

a toggle pivotally carried on said hook portion and spring means to bias the hook lock into locking position,

a pair of opposed housing bars each comprising:

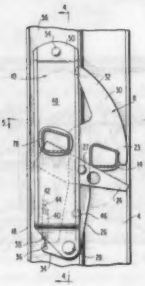
a substantially flat central web portion,

an L-shaped upper end and

a lower end that is off-set from said web portion in the direction of said upper end,

the upper end of one of said housing bars being fixed to the inner face of said first side rail of said fly section and the upper end of the other of said housing bars being similarly fixed to the inner face of said second side rail of said fly section,

spacer rings positioned between the inner faces of said fly section side rails and said lower ends of said housing bars,



rivets extending through said spacer rings connecting said housing bar lower ends to the respective fly section side rail,

each said hook lock being located in the space between the inner face of a fly section side rail and the central web portion of a housing bar with the pivoted lower end of the hook lock positioned between said spacer ring and said housing bar lower end and with one of said rivets extending through the hook lock lower end, and

a step member fixed between the central web portions of said opposed housing bars transversly of the side rails of said fly section in conformance, relative to the step members of said fly section, with said spacing of the step members of said bed section.

4,222,461

CONVEYING SYSTEM WITH A DRIVEN RECIPROCATING LOAD-HOLDING DEVICE WHICH IS GUIDED IN A HOLLOW COLUMN

Rolf Gunti, Laufen, Switzerland, assignor to Masyc AG, Munchenstein, Switzerland

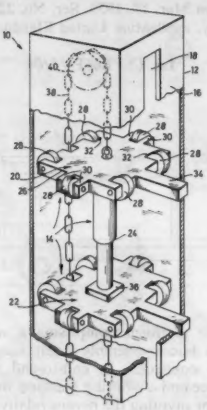
Filed Apr. 19, 1978, Ser. No. 897,708

Claims priority, application Switzerland, Apr. 19, 1977, 4840/77

Int. Cl.[2] **B66B** *7/00*

U.S. Cl. 187—20 **7 Claims**

1. A conveying device comprising a hollow column, a load holding device disposed in the interior of the hollow column and mounted for reciprocating longitudinal movement in said column, driving means for driving said load-holding device reciprocatingly in said column, the hollow column functioning as a guiding element for the load holding device, the hollow column having a longitudinal slit, the load holding device having load holding arms projecting laterally from the column through said slit, said load holding device being in the form of a carriage which comprises two carriage parts spaced apart from each other in the longitudinal direction of the column and a rigid bend-resistant spacer of adjustable length extending between and fixed to said carriage parts, each said carriage part comprising a carriage plate, roller elements, means mounting said roller elements rotatably at the sides of the carriage plate to bear upon the interior walls of the hollow column to roll



along said walls during longitudinal movement of the load-holding device in said column, said driving means including a tractive element having an end connected to each said carriage part.

4,222,462

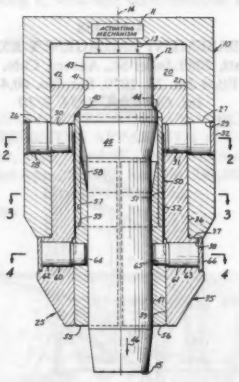
BRAKE TO DECELERATE AXIALLY MOVING ACTUATING ROD

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Filed Oct. 11, 1978, Ser. No. 950,402

Int. Cl.[2] **F16D** *63/00*

U.S. Cl. 188—67 **9 Claims**



1. A brake to decelerate the driving movement of the actuating rod of an impact device along an axis, said actuating rod being driven relative to a frame by an actuating mechanism, said actuating rod having an external tapered surface whose lateral dimension decreases in the direction in which it is driven by said actuating mechanism, said brake comprising:

a case attachable to said frame and having an internal axial passage;

a peripheral metal cylindrical brake band having an inner and an outer wall;

a rigid metal wedge member having an outer wall and a tapered inside wall with substantially the same taper angle

as the actuating rod said wedge member comprising a plurality of axial segments of a cylindrical structure grouped in a circle inside said brake band so as to form a substantially complete ring and so the outer walls of said segments make substantially a surface-to-surface contact with the inner wall of said brake band;

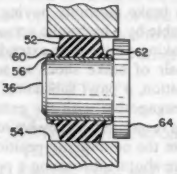
means axially to restrain the wedge member to said case, said wedge member and said brake band being disposed inside said passage, with the brake band between the case wall and said wedge member, there being a spacing between the wall of said passage and the outer wall of said brake band, said tapered inside wall being axially aligned with at least a portion of said inside wall of the brake band, and in lateral interference with at least a portion of said external tapered surface of said actuating rod.

4,222,463

MECHANICALLY ACTUATED BRAKE PISTON WITH ELASTOMERIC BUSHING

E. A. Domes, Carpentersville, and Dusan M. Vacval, Buffalo Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 5, 1979, Ser. No. 8,995
Int. Cl.[3] F16D *55/224*
U.S. Cl. 188—72.3 **13 Claims**



1. In a mechanically actuated disc brake including a caliper housing, said housing having a through bore for receiving a brake piston, a brake piston having a cylindrical body, said piston carried in said piston receiving bore for urging a brake pad into contact with a brake rotor, the improvement comprising:

an elastomeric bushing circumferentially disposed around the cylindrical body of said piston and in the interior of said through bore of said caliper housing, said elastomeric bushing simultaneously in contact with said piston and said caliper housing, said elastomeric bushing fixed in position in said through bore and on said piston.

4,222,464

DISC BRAKE APPARATUS FOR A MOTOR VEHICLE

Michio Moriya, and Yukinori Nishiyama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 18, 1978, Ser. No. 970,308
Claims priority, application Japan, Dec. 17, 1977, 52-169848[U]
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.3 **5 Claims**

1. A disc brake apparatus for a motor vehicle comprisng:

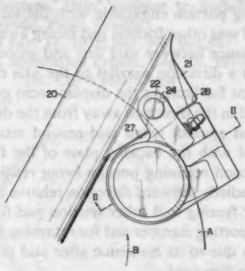
a brake disc,

a brake caliper disposed to straddle over said brake disc and having a pair of caliper arms which extend to embrace therebetween a peripheral portion of said brake disc said caliper having a first end surface facing in the forward running direction of said motor vehicle,

a pair of brake pad assemblies each mounted on each of said caliper arms and disposed in opposition to each other with said brake disc interposed therebetween,

hydraulic actuating means disposed in one of said caliper arms and adapted to press directly one of said brake pad assemblies against said brake disc and press indirectly the other brake pad assembly against said brake disc through corresponding movement of said caliper upon application of brake,

a mounting block formed on a stationary portion of said motor vehicle and formed therein with a single through-hole extending substantially perpendicular to said brake disc, said mounting block projecting in a direction opposite to the rotating direction of said brake disc which corresponds to the forward running direction of said motor vehicle, said mounting block having a second end



surface confronting said first end surface, whereby torque is transmitted to said mounting block through contact of said surfaces upon application of the brake during forward running of said vehicle, and

at least one pin secured to said brake caliper and extending slidably through said through-hole,

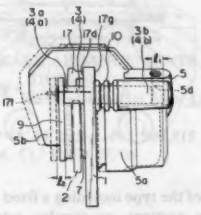
said pin serving to mount said brake caliper on said stationary portion through said mounting block and at the same time to guide said movement of said caliper relative to said brake disc.

4,222,465

DISC BRAKE FRICTION PAD RETAINING STRUCTURE

Tetsuo Haraikawa, Funabashi, and Koichi Tamura, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Apr. 20, 1979, Ser. No. 32,108
Claims priority, application Japan, Apr. 20, 1978, 53-46835
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.5 **4 Claims**



1. A disc brake comprising:

a rotatable disc;

a pair of friction pads having backing plates and disposed on opposite sides of said rotatable disc;

a supporting member adapted to be secured to a nonrotatable part of a vehicle and slidable supporting said pair of friction pads thereon for sliding movement in a direction parallel to the axis of the disc;

a caliper slidably supported on said supporting member for sliding movement in a direction parallel to the axis of the disc and having a piston for pressing one of the friction pads against the disc and a leg portion engaging with the other friction pad, said other friction pad being movable

on said supporting member for being removed from the supporting member by displacing the friction pad in the direction away from the disc by a predetermined amount, and said caliper being displaceable by an amount exceeding said predetermined amount and in a direction for moving the leg portion of the caliper away from the disc; and

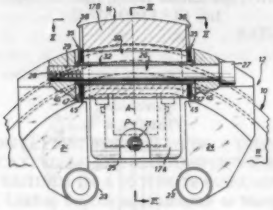
a pad spring disposed between the caliper and the pair of friction pads, said pad spring having a first retaining portion engaged with the supporting member and a second retaining portion engagable with the side of the backing plate of said other friction pad facing away from said disc, the distance between said first and second retaining portions in a direction parallel to the axis of the disc being sufficient for limiting the displacement of said other friction pad in the direction away from the disc to said predetermined amount when said second retaining portion is engaged with the backing plate of the friction pad, and said second retaining portion being resiliently distortable in the radially outward direction relative to the axis of said disc for freeing said other friction pad for removal from the supporting member and for returning to its undistorted position due to its resilience after said other friction pad has been removed.

4,222,466

BRAKE HAVING AN ANNULAR CYLINDRICAL BRAKING MEMBER AND A PIVOTALLY AND SLIDABLY MOUNTED CALIPER MEMBER

Gilbert J. Brimaud, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 16, 1978, Ser. No. 906,601
Claims priority, application France, May 17, 1977, 77 15043
Int. Cl.[2] F16D *53/00*
U.S. Cl. 188—76 **16 Claims**



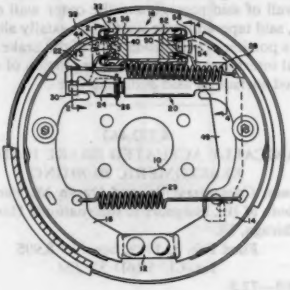
1. A brake of the type including a fixed support having a pair of spaced leg portions, an annular, substantially cylindrical rotary braking member, brake shoes disposed respectively inside and outside said braking member, a generally C-shaped caliper member radially straddling said brake shoes and said braking member, control means for urging both said brake shoes against said braking member; the improvement comprising a composite mounting assembly for pivotally and slidably mounting said caliper member on said fixed support including a pin member which extends between said leg portions and through a radially elongated oblong passageway in said caliper member, a tubular bracing member telescoped over and sheathing said pin member, said pin member being firmly connected to said leg portions with each end of said tubular bracing member bearing against the corresponding leg portion of said fixed support.

4,222,467

DRUM BRAKE ADJUSTER

Michael A. Kluger, and Robert T. DuCharme, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 2, 1979, Ser. No. 8,729
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—79.5 GE **8 Claims**



1. In a drum brake assembly having a pair of brake shoes which are movable by a hydraulic actuator from a nonbraking position to a braking position, an extendible member cooperating with the pair of brake shoes to substantially define the nonbraking position, a pawl substantially defining an arcuate abutment and engageable with the extendible member to extend the latter in response to excessive movement of the pair of brake shoes from the nonbraking position to the braking position, said arcuate abutment forming a pocket, a resilient member engageable with the pawl to impart rotation to the pawl when the pair of brake shoes move from the nonbraking position to the braking position, characterized by the pawl being pivotally engaged with the hydraulic actuator at said arcuate abutment and with one of said brake shoes at said pocket so as to pivot relative to the extendible member when the hydraulic actuator is operable.

4,222,468

COMBINATION PORTABLE STORAGE CONTAINER AND HEAD REST

Donald De Fries, 5223 N. Oakview, Chicago, Ill. 60656

Filed Aug. 29, 1978, Ser. No. 937,894
Int. Cl.[3] A45C *9/00*
U.S. Cl. 190—42 **6 Claims**

1. A combination portable storage container and head rest, comprising:

an elongated inner rigid tubular member having front and rear ends;

an elongated outer resilient tubular member having front and rear ends and being axially aligned with and surrounding said inner rigid member;

an elongated covering enclosing said outer resilient member, said covering having openable means for permitting access to the interior thereof;

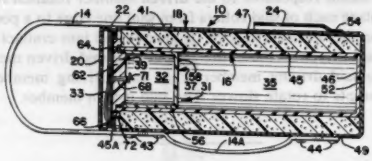
means defining a large storage compartment disposed within said inner tubular member for storage purposes;

small container means removably mounted within said inner tubular member for additional storage purposes, whereby access to said compartments is available through said openable means, the inner and outer tubular members each being open at least at their front ends, said inner member includes a rear end wall, said covering being composed of flexible fabric material and having an end flap serving as a closure member for the open ends of said inner and outer tubes;

fastening means for holding releasably said end flap in its

closed position over said open ends, said covering having a generally cylindrical body portion and its end flap being generally circular in shape, said fastening means including a slide fastening device interconnecting said body portion and said flap; and

handle means fixed to the outer surface of said covering to facilitate carrying the unit, said handle means being composed of a single strip of flexible material, said strip being



fixed at one of its ends to said covering near the front end portion thereof; said strip being detachably connected intermediate its ends to the opposite side of the covering near said front end to form an end handle portion, said strip being detachably connected at its opposite end near the rear end portion of said covering to form a side handle portion, whereby said opposite end of said strip may also be attached near said front end portion to enlarge said end handle portion to serve as a shoulder strap.

4,222,469

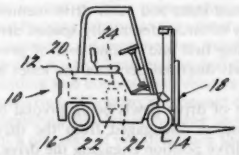
INCHING CONTROL SYSTEM FOR INDUSTRIAL LIFT TRUCKS

William J. Kubolis, Mt. Ephrain, N.J., and Victor L. Chun, Holland, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 732,822, Oct. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 637,556, Dec. 4, 1975, abandoned. This application Nov. 22, 1978, Ser. No. 962,846

Int. Cl.[3] B60K *29/02*; F16D *25/10*

U.S. Cl. 192—4 A **9 Claims**



1. In a vehicle having brakes, an engine, a transmission having fluid actuated clutch means having first and second actuating chamber means, and an inching control system having a reservoir, a pump fluidly connected to the reservoir and driven at engine speed, selector valve means fluidly connected to the outlet of the pump and operative to selectively port fluid therefrom to one of said actuating chamber means, and control valve means fluidly connected to the pump for decreasing the pressure applied to the selected actuating chamber means in response to increases in brake actuation forces, an improvement wherein:

A. a restriction is fluidly connected in series between said pump and a portion of said transmission whereby the outlet pressure of said pump is caused to vary in response to changes in the speed of said engine;

B. said selector valve means, said control valve means, and said restriction are fluidly connected to the outlet of said pump through a pump outlet conduit in parallel fluid relationship with one another, and

C. said control valve means is operative to sense brake actuation force and to decrease the outlet pressure of said pump in response to an increase in said actuation force above a predetermined value.

4,222,470

BAND BRAKE FOR A ROTATING MEMBER, AND A CLUTCH HAVING SUCH A BRAKE

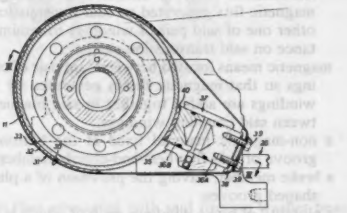
Carlo Beccaris, Santena, Italy, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Sep. 13, 1978, Ser. No. 941,987

Claims priority, application France, Sep. 16, 1977, 77 27970

Int. Cl.[3] V16D *67/04*

U.S. Cl. 192—17 A **8 Claims**



1. A band brake for a rotatable member having a cylindrical bearing surface, said band brake comprising a brake band extending in a loop around a cylindrical bearing surface of said rotatable member, and a hydraulic operating member adapted to apply said brake band against part of said cylindrical bearing surface, said operating member comprising two elements independently movable in opposite directions and disposed between the brake band and the cylindrical bearing surface, said elements being disposed substantially radially in relation to said cylindrical bearing surface and in axial alignment with each other radially of said cylindrical bearing surface, one of said elements being cooperable with said brake band to apply said brake band against said part of said cylindrical bearing surface and the other of said elements being associated with a brake shoe to apply said brake shoe against another part of said cylindrical bearing surface diametrically opposite the first mentioned part thereof.

4,222,471

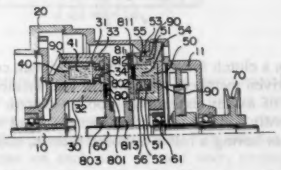
CLUTCH AND BRAKE ARRANGEMENTS FOR A MOTOR

Yung-San Hsu, No. 132, Ho Ping Rd. Hsi Men Li, Tao Yuan City, Taiwan

Filed May 11, 1978, Ser. No. 904,815

Int. Cl.[2] F16D *67/06*

U.S. Cl. 192—18 B **1 Claim**



1. A clutch and brake device for controlling motion of a transmission shaft, comprising:

a motor shaft;

a transmission shaft;

a supporting means connected to said motor shaft;

a flywheel-and-clutch member, having the provision of a rim groove;

an iron core having the provision of a circular depression defined thereon, being fixed onto said supporting means and extending within said rim groove of said flywheel-and-clutch member with a clearance defined between said rim groove and said flywheel-and-clutch member;

a pair of coupling windings each of which is wired within said circular depression of said iron core, said windings being wound in directions opposite to each other so that current passing through one of the windings is opposite to current passing through the other one of said pair of windings, said pair of windings being positioned in end-to-end alignment with each other, both windings being spaced from each other and in spaced parallelism with the transmission shaft so that magnetic flux generated on said transmission shaft by one of said windings is offset by magnetic flux generated on said transmission shaft by the other one of said pair of windings to minimize net inductance on said transmission shaft;

magnetic means located between said pair of coupling windings so that magnetic fluxes generated by said coupling windings are added together in said magnetic means between said coupling windings;

a non-magnetic material fixed at the bottom of said rim groove of said flywheel-and-clutch member;

a brake member, having the provision of a plurality of ring shaped grooves;

a plurality of brake windings each of which is wired respectively in one of said ring shaped grooves in opposite directions to each other to minimize the overall inductance and the overall reactive electromotive force, said brake windings being in spaced parallelism with each other and with the transmission shaft;

a clutch disc connected to said transmission shaft and located adjacent said set of coupling windings; and

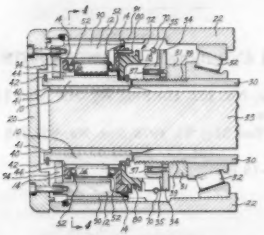
a brake disc connected to said transmission shaft and located adjacent said brake windings.

4,222,472

FULLY AUTOMATIC ROLLER LOCKING HUB

Thomas M. Telford, Gladstone, Oreg., assignor to Warn Industries, Inc., Kent, Wash.

Filed Apr. 28, 1978, Ser. No. 901,149
Int. Cl.[2] F16D *15/00, 41/06*
U.S. Cl. 192—36 **8 Claims**



1. In a clutch for use between rotational, concentric driving and driven members, with one of said members having a plurality of axially extending grooves therein opening radially outwardly toward said other member, and with each of said grooves having a roller disposed therein, said clutch comprising:

(a) a cage rotatably disposed between said concentric members in slidable contact with said driven member, said cage having said plurality of rollers therein;

(b) a spindle drag nut disposed between said concentric members in stationary spaced apart relationship thereto;

(c) a drag shoe slidably movable over said spindle drag nut and one of said members and in a cammed engagement with said cage such that as said drag shoe moves over said drag nut and said member upon initial rotation of said member, the torque generated therebetween axially displaces and rotates said cage into frictional engagement with said driven member moving said rollers radially out of said grooves up on one edge thereof and into contact with said driven member locking said driven member to said driving member whenever said driving member attempts to rotate faster than said driven member;

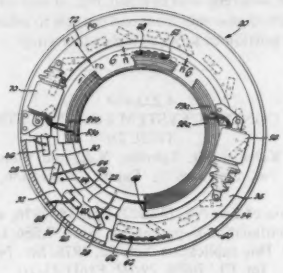
(d) means responsive to the driven member rotation to displace each of said rollers from said one edge to a position on the opposite edge of its groove and into contact with said driven member, thereby locking said driven member to said driving member when said driving member attempts to rotate slower than said driven member.

4,222,473

FOUR WAY PAWL CLUTCH

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 5, 1979, Ser. No. 17,387
Int. Cl.[3] F16D *11/06, 13/04*
U.S. Cl. 192—43.1 **5 Claims**



1. A pawl clutch comprising:

radially spaced inner and outer drive members each having a plurality of circumferentially spaced drive teeth,

a cage having first and second sets of pivotally mounted drive pawls disposed between the inner and outer drive members,

said first set of drive pawls being pivotal between a freewheel position disengaged from the drive teeth and a forward drive position engaging the drive teeth whereby one of the drive members drives the other in a forward direction,

first phasing means resiliently coupled to the first set of drive pawls for selectively biasing the first set of drive pawls toward either the freewheel or the forward drive position,

said second set of drive pawls being pivotal between a freewheel position disengaged from the drive teeth and a reverse drive position engaging the drive teeth whereby the one drive member drives the other in a reverse direction, and

second phasing means resiliently coupled to the second set of drive pawls for selectively biasing the second set of drive pawls toward either the freewheel position or the reverse position,

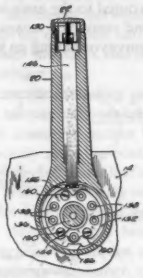
said pawl clutch freewheeling when both sets of drive pawls are biased in their respective freewheel positions, driving in one or the other direction when one set of drive pawls is biased in the drive position and the other set of drive pawls is biased in the freewheel position, and locking-up when both sets of drive pawls are biased in their respective drive positions.

4,222,474

SINGLE LEVER CONTROL WITH DETENT MECHANISM FOR HOLDING LEVER VERTICALLY

Hrishikesh Choudhury, Gurnee, Ill., and Heinrich E. Luksch, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 772,430, Feb. 28, 1977, Pat. No. 4,119,186.
This application Mar. 27, 1978, Ser. No. 890,038
Int. Cl.[2] B60K *41/02*
U.S. Cl. 192—0.096 2 Claims



1. A single lever control comprising a housing including a side wall, a control lever, a shaft journaled by said side wall for rotation relative to said housing and about an axis extending horizontally when said side wall is vertically disposed, said shaft being operable in response to rotation thereof to actuate a remotely located throttle relative to a neutral position, means connecting said control lever to said shaft in a selected one of a plurality of angularly spaced locations of said control lever relative to said shaft to provide for common movement of said control lever and said shaft in both rotary directions to actuate the remotely located throttle in response to movement of said control lever, whereby said control lever can be located substantially vertically when the throttle is in the neutral position irrespective of the angular disposition of said housing relative to the axis of said shaft, and detent means for releasably locating said control lever in an upright vertical position when the throttle is in the neutral position irrespective of the angular disposition of said housing relative to the axis of said shaft, said detent means comprising a detent member, releasable interengaging means on said control lever and on said detent member for releasably holding said control lever relative to said detent member, and means on said housing and on said detent member for selectively mounting said detent member on said housing in a selected one of a plurality of positions such that engagement of said releasable interengaging means releasably holds said control lever in the vertical position when the throttle is located in the neutral position.

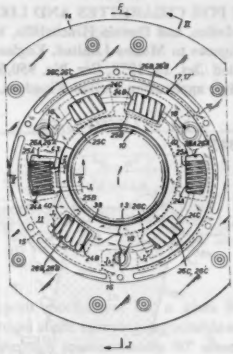
4,222,475

TORSION DAMPING DEVICE, PARTICULARLY FOR A MOTOR VEHICLE CLUTCH

Jean Claude Fenart, Fourqueux, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Nov. 9, 1977, Ser. No. 849,882
Claims priority, application France, Nov. 15, 1976, 76 34242
Int. Cl.[2] F16D *3/14*
U.S. Cl. 192—106.2 10 Claims

1. A torsion damping device, particularly for a motor vehicle clutch, of the kind comprising two coaxial parts mounted for rotation relative to one another within the limits of a determined relative angular movement sector, a first of said coaxial parts including a disc and a second of said coaxial parts including two guide washers extending parallel to the said disc one on each side of said disc and connected to each other by small posts, elastic means interposed circumferentially between said coaxial parts, and friction means interposed axially between said coaxial parts, said friction means comprising at least one friction washer which is subjected to the action of elastic clamping means having an axial action and which, when in contact with one of said coaxial parts, is adapted to be fastened to the other of said coaxial parts for at least part of the sector of angular movement, and said elastic clamping means having



an axial action thus associated with said friction washer bearing against a transverse shoulder turned towards one of said guide washers and urging said friction washer in the direction of said one guide washer and axialy away from said disc, said friction washer being between said elastic clamping means and said one guide washer.

4,222,476

TORSION DAMPING DEVICE FOR FRICTION PLATE HAVING A FLEXIBLE CENTER

Raymond LeBrise, Montmorency, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Sep. 7, 1977, Ser. No. 831,232
Claims priority, application France, Sep. 23, 1976, 76 28561
Int. Cl.[2] F16D *47/02*
U.S. Cl. 192—106.2 21 Claims

1. A torsion damping device comprising two coaxial parts mounted to rotate with respect to each other, within predetermined range of angular clearance, including a first part comprising a web and second part comprising two annular guide plates disposed one on each side of said web, cross-pieces interconnecting said annular guide plates, a circumferential array of resilient means circumferentially interposed between said parts, friction means adapted to operate between said parts for at least part of said range of angular clearance, said friction means being disposed at the outer periphery of one of said annular guide plates, at least a part of said friction means being carried by an annular support member axially coupled to said

one annular guide plate in cooperation with axially acting resilient means, drive means being provided between said support member and said web, a clip forming an independent U-shaped member engaged radially on the support member and the annular guide plate which said support member flanks.

4,222,477

RESERVOIR FOR CIGARETTES AND LIKE ARTICLES

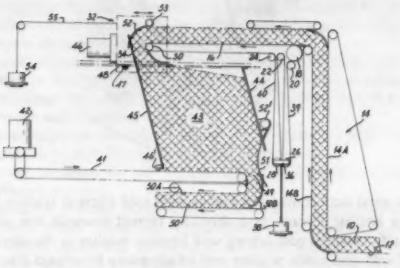
Desmond W. Molins, and Dennis Hinchcliffe, both of London, England, assignors to Molins Limited, England

Filed Oct. 12, 1978, Ser. No. 950,670

Claims priority, application United Kingdom, Oct. 27, 1977, 44671/77

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—347 **8 Claims**



1. A reservoir system for cigarettes and other similar rod-shaped articles comprising a delivery conveyor arranged to convey the articles horizontally towards an inlet to the reservoir; a reservoir conveyor which lies below the delivery conveyor and is arranged to receive a stack of the articles delivered through the inlet and to run, when necessary, in a direction opposite to that of the delivery conveyor; a horizontally movable carriage carrying a movable end wall defining an end of the stack of articles on the reservoir conveyor adjacent to the inlet, and carrying also a sensor adjacent to the inlet which controls the direction of movement of the carriage; and an outlet for articles at the end of the reservoir conveyor towards which the latter moves.

4,222,478

ARTICLE FEEDING SYSTEM FOR PARALLEL-OPERATING MACHINES

Markus Gasser, Gächlingen, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Feb. 13, 1979, Ser. No. 11,895

Claims priority, application Switzerland, Feb. 14, 1978, 1637781

Int. Cl.[3] B65G *47/51*

U.S. Cl. 198—358 **14 Claims**

1. In a system for feeding spaced, serially arranged articles to a plurality of article processing machines operatively connected to the system and including a plurality of normally, simultaneously operating article processing first machines and a standby article processing second machine for assuming the operation of a non-operating first machine; the improvement comprising

(a) a plurality of first article aligning apparatuses, one associated with each said first machine for aligning and serially arranging randomly received articles;

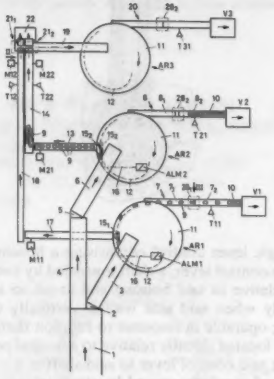
(b) a second article aligning apparatus associated with said second machine for aligning and serially arranging randomly received articles;

(c) a first conveyor means extending from each said article aligning apparatus to the respective first and second machines for supplying serially arranged articles to the respective first and second machines from the article aligning apparatus associated therewith;

(d) an article deflecting means operatively connected with each said first article aligning apparatus; each said article deflecting means having a first position for routing the articles on the associated first article aligning apparatus to the associated first conveyor means and a second position;

(e) a second conveyor means extending from each said first article aligning apparatus to said second article aligning apparatus; in said second position of said article deflecting means the articles on the associated first article aligning apparatus being routed to the associated second conveyor means; said second conveyor means including

(1) a collecting conveyor having an inlet and an outlet that



extends to said second article aligning apparatus for feeding articles thereto;

(2) a plurality of buffer conveyor means extending from each said first article aligning apparatus to said inlet of said collecting conveyor for feeding articles to said collecting conveyor from that first article aligning apparatus where the associated said article deflecting means is in its second position;

(f) separate drive means connected to each said buffer conveyor means;

(g) energizing means for energizing the respective said drive means when the respective said article deflecting means assumes its said second position; and

(h) actuating means for individually moving each article deflecting means into one of said positions.

4,222,479

CONTAINER CONVEYING AND TRANSFER SYSTEM

Larry M. Dugan, Boulder, and Danny L. McMillin, Golden, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Nov. 13, 1978, Ser. No. 960,232

Int. Cl.[3] B65G *47/04*

U.S. Cl. 198—482 **24 Claims**

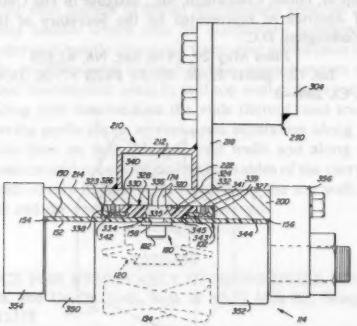
1. Apparatus for continuously conveying decorated container members having wet ink images on the outer periphery thereof between a first continuously moving rotatable mandrel wheel type container carrying apparatus of a high speed container decorator or coater machine and a high speed second continuously linearly moving pin chain container carrying apparatus comprising:

a continuous one piece resilient flexible endless belt conveyor means movable in a predetermined endless path between the first and second continuously moving container carrying apparatus including a first path portion located in juxtaposition to the first continuously moving container carrying apparatus for receiving decorated

container members therefrom and a second path portion located in juxtaposition to the second continuously moving container carrying apparatus delivering decorated container members thereto;

a plurality of individual longitudinally spaced vacuum cup means fixedly centrally mounted in longitudinal single file equally spaced relationship on and extending laterally outwardly of and being continuously movable with said continuous belt conveyor means in fixed relationship therewith for holding a single container member on each of said vacuum cup means, only by application of vacuum thereto during movement between the first and second continuously moving container carrying apparatus and for releasing container members therefrom only by removal of vacuum therefrom;

vacuum chamber means extending along the path of movement of and in substantially sealed relationship with said continuous belt conveyor means between the first and second continuously movable container carrying apparatus and being connected to each of said vacuum cup means adjacent to the first continuously moving container carrying apparatus for receiving and holding container members delivered therefrom and being disconnected from each of said vacuum cup means adjacent to the second continuously moving container carrying apparatus for releasing the container members for supportive engagement therewith and being continuously connected to each of said vacuum cup means during movement between the first continuously moving container carrying apparatus and the second continuously moving container carrying apparatus for holding the container members thereon solely by applied vacuum during non-supportive association with the second continuously moving container carrying apparatus;



a connecting means associated with each vacuum cup means and extending through and beyond said belt conveyor means for connecting said vacuum cup means to said belt conveyor means and having a vacuum passage therein for connecting said vacuum chamber means to said vacuum cup means;

belt guide means extending between the first and second container carrying apparatus for slidably sealably receiving and guiding said belt conveyor means therebetween;

elongated relatively narrow width guide slot means associated with said belt guide means for slidably receiving and guiding said connecting means and being connected to said vacuum chamber means for continuously supplying vacuum to said vacuum cup means during movement between the first and second container carrying apparatus; and

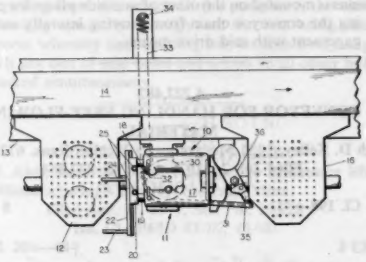
wheel means for guidably supporting said belt conveyor means and having slot means for receiving said connecting means.

4,222,480

90° SWEEPOUT DRIVE MECHANISM

Jack I. Perry, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 28, 1978, Ser. No. 946,903
Int. Cl.³ B65G 47/04, 47/82
U.S. Cl. 198—490 **6 Claims**



1. In sweepout mechanism for a glass forming machine wherein a vertical shaft, carrying retractable sweepout fingers, is oscillated through approximately 90° about its axis by the turning of a sprocket which is mounted for rotation on the shaft, the improvement in the drive connection between the sprocket and shaft comprising:

a disc member fixed to said shaft, said sprocket mounted on said shaft in juxtaposition to said disc member;

a circumferential slot formed in said sprocket and extending approximately 90° of the circumference of said sprocket;

a pin mounted to said disc member and extending into said slot; and

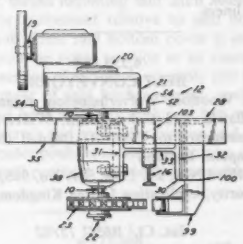
spring means extending between said sprocket and shaft for yieldingly maintaining said pin at one end of said slot.

4,222,481

DRIVE UNIT FOR A CONVEYOR CHAIN

Clarence A. Dehne, Farmington Hills, and Martin Pachuta, Troy, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Division of Ser. No. 869,218, Jan. 13, 1978, Pat. No. 4,175,657.
This application Mar. 19, 1979, Ser. No. 22,038
Int. Cl.² B65G 21/20
U.S. Cl. 198—684 **8 Claims**



1. In a drive unit for propelling a conveyor chain along a path defined by a conveyor track, said drive unit including a fixed frame and drive means supported thereby for engaging the conveyor chain; a reducer having an output shaft connected to the drive means, an input shaft, and a housing; a motor drivingly connected to the input shaft; and means mounting the motor and reducer for movement relative to the fixed frame; the improvement wherein:

said fixed frame comprises a pair of vertical side plates ex-

tending longitudinally parallel to the conveyor track and rigidly connected in transversely spaced relation;

track supporting means positions the conveyor track between said side plates:

bearing means is mounted on one of said side plates for supporting the reducer output shaft;

said drive means for engaging the conveyor chain is mounted on the reducer output shaft and on said one side plate on one side of the conveyor chain; and,

means is mounted on the other of said side plates for preventing the conveyor chain from moving laterally out of engagement with said drive means.

4,222,482

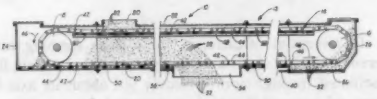
CONVEYOR FOR HANDLING FREE-FLOWING MATERIAL

Hugh D. Kelley, 1451 Morgantown, Wichita, Kans. 67212

Filed Jul. 24, 1978, Ser. No. 927,354

Int. Cl.³ B65G *19/30*

U.S. Cl. 198—721 **8 Claims**



1. A conveyor for handling free-flowing material such as grain products or the like, the conveyor comprising:

an elongated conveyor housing having a bottom portion and side portions;

and endless chain disposed above the bottom portion of said housing;

drive means for engaging and driving said chain thereon, said drive means attached to the side portions of said conveyor housing;

a plurality of conveyor bottom liners positioned on top of the bottom portion of said conveyor housing, said endless chain and said flights disposed on top of said bottom liners and riding thereon, said bottom liners laid end to end with a space therebetween sufficient to allow the liners to expand lengthwise and a space between the sides of said bottom liners and the side portion of said housing to allow said bottom liners to expand laterally;

first attachment means for securing said bottom liners to the top of the bottom portion of said conveyor housing and providing means for expansion and contraction of said bottom liners on the bottom portion of said housing; and

V-shaped flights attached to said endless chain, the width of the flights greater than the space between the ends of said bottom liners.

4,222,483

BELT CONVEYORS

Raymond J. Wootton, Wolverhampton; Kenneth E. Walker, West Midlands, and Colin Smith, Wolverhampton, all of England, assignors to U.M.E.C.-Boydell (belting) Limited, Wolverhampton, England

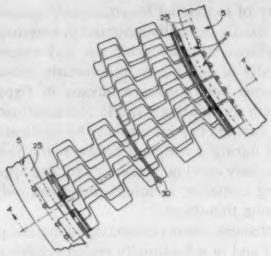
Filed Nov. 22, 1978, Ser. No. 963,098

Claims priority, application United Kingdom, Nov. 22, 1977, 48495/77

Int. Cl.² B65G *15/02*

U.S. Cl. 198—831 **10 Claims**

9. A conveyor belt constructed and arranged for travel along a path including a lateral curve, comprising a series of transverse rods spaced apart longitudinally of said belt, a plurality of load-supporting belt sections extending between and pivoted to said transverse rods, guide blocks at opposite ends of and retained to said transverse rods having substantially friction-less bearing parts adapted to co-operate when the belt is in use with runners adjacent the sides of the belt at the lateral curve, each said guide block having said end portions of two adjacent said transverse rods retained thereto and said guide blocks being formed with recesses therein extending lengthwise of said belt transversely through which said end portions pass, and links which interconnect said transverse rods at said



end portions within said recesses, said blocks and links being constructed and arranged to allow relative movement between said transverse rods longitudinally of said belt when said belt travels around said lateral curve.

4,222,484

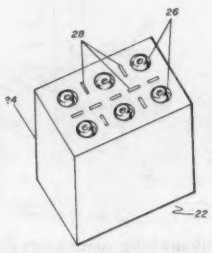
ANTIPROPAGATION EXPLOSIVE PACKAGING MEANS

Philip M. Howe, Conowingo, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 29, 1979, Ser. No. 42,825

Int. Cl.³ B65D *81/08, 85/30;* **F42B** *37/00, 39/00*

U.S. Cl. 206—3 **9 Claims**



1. In a container for a plurality of individual explosive munitions;

support means for supporting said munitions in spaced-apart relationship, and

shield means consisting of elongate rods of low shock impedance material, one of said rods being secured within said container midway between each of said spaced-apart munitions.

4,222,485

ONE-PIECE CONTAINER HAVING AN INTEGRAL HANDLE

Heinz Focke, 309 Verden Moorstrasse, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 390,263, Aug. 21, 1973, Pat. No. 3,937,391, which is a continuation-in-part of Ser. No. 83,581, Oct. 23, 1970, abandoned. This application Nov. 21, 1975, Ser. No. 634,100

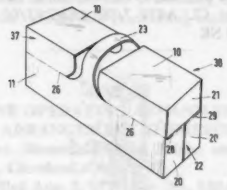
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1969, 1953350

Int. Cl.³ B65D *71/00*

U.S. Cl. 206—141 **1 Claim**

1. A container formed foldable material for the accommodation of a plurality of articles therein, said container having a

top wall, side walls, end walls, bottom walls and edge flaps of integral one-piece construction, means securing said edge flaps to each other to define a longitudinally extending central partition parallel to said side walls, said top wall having two spaced apart transverse perforation line extending across the entire width of the top wall and beyond the opposite edges of the top wall part way into each side wall to define a carrying handle therebetween, longitudinally extending perforation lines in said side walls extending from the ends of each transverse perforation line toward the adjacent end of the container substantially parallel to the top wall and additional perforation lines in the end walls of the container which are continuations of said longitudinal performation lines, transverse dividing cuts



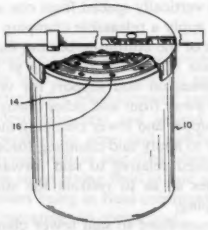
spaced from said transverse perforation lines on each side of said handle which intersect the transverse perforation lines adjacent the ends thereof to define intermediate areas on each side of said handle which may be completely removed or folded under said handle along said transverse perforation lines to provide reinforcement for said handle, tongue means connecting said intermediate areas to said top wall portions across said dividing cuts intermediate the ends thereof, said tongue means having perforations so that upon separation along said perforation lines on said side and end walls and along said perforations on said tongue means on both sides of the carrying handle, end covers formed from portions of the top wall, the side walls and the end walls can be removed.

4,222,486

DEVICE FOR REMOVABLY STORING DRILL BITS

Leo Roth, and Ursula Roth, both of 52-27 69th St., Maspeth, N.Y. 11378

Filed Jun. 18, 1979, Ser. No. 49,183
Int. Cl.[3] B65D *85/20, 83/02, 85/26*
U.S. Cl. 206—379 **5 Claims**



1. A device for removably storing a plurality of elongated drill bits of circular cross section, said bits having different diameters, said device comprising:

a vertical cylindrically shaped container having a top surface defining a flat horizontal spiral which has an inner end substantially coincident with the longitudinal axis of said container and has an outer end at the outer periphery of said surface, said spiral having a plurality of spaced holes disposed along the path defined by the spiral, whereby each bit can be removably disposed in a corresponding hole and extends in a direction parallel to said axis;

an elongated slider element having an opening therein and slidably engaging said spiral whereby said element can be moved back and forth therealong, said opening overlying said spiral; and

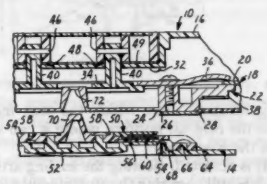
a circular cover overlying said top end and manually rotatable thereabout, said cover having a radial slot therein extending from the center to the periphery, the element extending upwardly through said slot and being slidable therein whereby said opening can be selectively aligned with any one of said holes and access to all other holes is blocked simultaneously.

4,222,487

SINGLE DISK CARTRIDGE

Allen J. Abel, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1979, Ser. No. 29,528
Int. Cl.[2] B65D *85/02, 45/00*
U.S. Cl. 206—444 **3 Claims**



1. A disk cartridge comprising a disk assembly having an axis and including a central hub having an opening on one end; a protective top cover enclosing said disk assembly and having an aperture affording access to the end of said hub having the opening; a handle pivotably mounted at the side of said top cover opposite said aperture for movement between raised and lowered positions; means coupled to said handle for moving said disk assembly axially away from said aperture when said handle is raised and for affording axial movement of said assembly toward said aperture when said handle is lowered; a removable bottom cover adapted to engage said top cover over said aperture; means for releasably attaching said bottom cover to said disk assembly comprising a manually activatable latch assembly adapted to enter said opening and releasably engage said hub; means mounting said latch assembly on said bottom cover for movement relative to said bottom cover axially of said hub when said bottom cover is engaged with said top cover from an outer position to an inner position to afford manual insertion of said latch assembly into said opening prior to engagement of said latch assembly, and subsequent movement of said latch assembly with said hub as said handle is raised and lowered; and means for biasing said latch assembly toward said outer position to bias said bottom cover against said top cover in all positions of said disk assembly within said top cover.

4,222,488

METHODS AND APPARATUS FOR SORTING ARTICLES

Jerry R. Jones, Greenfield, and Ralph F. Stephens, Carmel, both of Ind., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,302
Int. Cl.[3] B07C *5/00*
U.S. Cl. 209—583 **17 Claims**

1. A method of sorting a succession of articles in accordance with a characteristic thereof, which comprises:

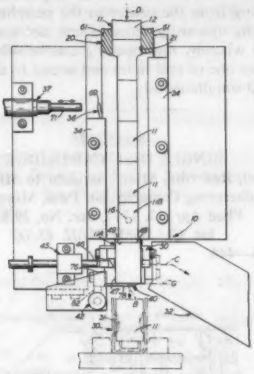
(a) advancing a row of the article along a chute;

(b) stopping the leading article in the row at a test position

along the chute with a releasable stop member that engages the leading article so that the following articles in the row stack up behind the leading article;

(c) testing the leading article for the characteristic to detect whether the article is of a first type I or a second type II;

(d) if type I is detected, releasing the stop member so that the leading article advances further along the chute to a first



receiving location, after which the stop member is returned to the original position where it can stop the next article in the row; and

(e) if type II is detected, ejecting the leading article from the chute, while still engaging the stop member, in a direction transverse to the direction of advancement of the articles along the chute and without releasing the stop member.

4,222,489

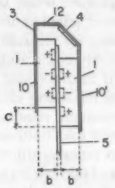
CLAMPING DEVICES

Hans-Georg Hutter, Beckgasse 46, Vienna, Austria (A-1130)

Filed Aug. 22, 1977, Ser. No. 826,516

Int. Cl.[2] A47F 7/16

U.S. Cl. 211—45 **10 Claims**



1. A clamping device for clamping blade-shaped material and operable with one hand to remove and insert the blade-shaped material into the clamping device, comprising:

two parallely arranged strips movable relative to each other, each said parallely arranged strips including at least two oppositely poled magnetic regions, and

means interconnecting said strips to move them from a first position in which said oppositely poled magnetic regions on one of said strips faces said oppositely poled magnetic regions on said other of said strips of like magnetic polarity so as to repel each other magnetically and maintain said strips in an open-material release position, to a second position in which said oppositely poled magnetic regions on one of said strips faces said oppositely poled magnetic regions on said other of said strips of unlike magnetic polarity so as to attract each other magnetically and cause said strips to move as a result of magnetic attraction into its closed and material pickup and clamping position, said interconnecting means including: a common flexible support including first and second strip carrying walls, and a third wall pivotally interconnecting and linking said first and second walls, at least one pair of said strips being carried by said first and second walls, said strips on said first and second walls being spaced from each other in their open-material release position to provide a free center space therebetween, the width of said third interconnecting wall being equal to sum of the widths of said strips and said free center space therebetween.

4,222,490

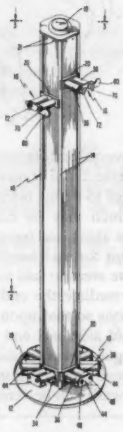
APPARATUS FOR STORING SKIS

Theodore N. Wood, Jr., Pole 257, Harvey's Lake, Pa. 18618

Filed Jan. 23, 1978, Ser. No. 871,340

Int. Cl.[2] A47F 7/00; A63C 11/02

U.S. Cl. 211—60 SK **15 Claims**



1. An apparatus for storing at least one pair of skis in bottom-to-bottom facing arrangement and in a generally upright orientation, with the skis of each pair contacting one another at forward and rearward contact zones, the apparatus comprising:

a generally upright support;

upper and lower clamping means positioned on said support at locations vertically spaced from one another, and each operable to apply a releasable clamping force against the top surfaces of the bottom-to-bottom facing skis; and

mounting means adjustably mounting at least one of said clamping means on said support for vertical movement toward and away from said other clamping means;

whereby said upper and lower clamping means are operable respectively to apply said clamping forces at spaced locations positioned relative to said forward and rearward contact zones so as to restrain the stored pair of skis against warping;

positioning means fixed to said lower clamping means and operable to engage the rear ends of the stored pair of skis to maintain said lower clamping means spaced rearwardly of the rearward contacting zone of the stored pair of skis;

said mounting means mounting said upper clamping means for movement toward and away from said lower clamping means;

said upper clamping means comprising:

first and second, generally cylindrical pressure members projecting outwardly from said support to define therebetween an outwardly open slot for reception of the stored skis along the edges;

a mounting pin eccentrically carrying one of said pressure

members so as to enable variations in the width of said slot; and

latch means including an arm pivotally mounted on said pin and operable both to close the outer end of said slot and to hold said pressure members in clamping engagement with the skis received in said slot; and

said lower clamping means comprising:

first and second, generally cylindrical pressure members projecting outwardly from said support to define therebetween a slot for reception of the stored skis; and

a mounting pin eccentrically carrying one of said pressure members so as to enable variations in the width of said slot; and wherein

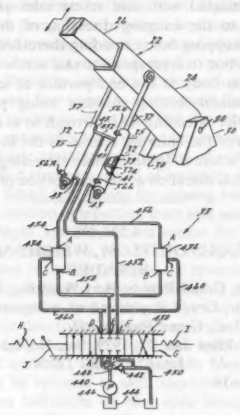
said slot is closed at its outer end by a bracket supporting said pressure members and presenting a ledge therebeneath which defines said positioning means.

4,222,491

CRANE OPERATING AID AND SENSOR ARRANGEMENT THEREFOR

Steven Geppert, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 2, 1978, Ser. No. 930,432
Int. Cl.[3] B66C *23/90*
U.S. Cl. 212—153 **14 Claims**



1. In a crane including a pivotably displaceable load supporting member and at least two hydraulic lift rams operative to luff said member through a predetermined range of operation, each said ram comprising first and second fluid receiving chambers and operative to urge said member upwardly in response to receiving fluid in said first chamber and downwardly in response to receiving fluid in said second chamber, said second chambers being in fluid communication with one another, a crane operating aid comprising:

a plurality of first sensors, one associated with each of said first fluid receiving chambers;

a second sensor associated with one of said second fluid receiving chambers, each of said first and second sensors operative to generate a signal as a function of the pressure within the chamber associated therewith;

averaging means operative to receive said signals and to generate a signal representative of the average of said first chamber pressure signals; and

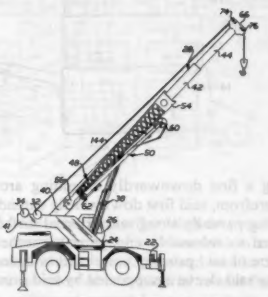
differentiating means operative to generate a reaction force output signal as a function of the difference between said second chamber pressure signal and said average signal.

4,222,492

METHOD FOR EXTENDING A BOOM ASSEMBLY

James G. Wuerflein, and Charles R. Spence, both of Winona, Minn., assignors to Burro-Badger Corporation, Winona, Minn.

Division of Ser. No. 742,009, Nov. 15, 1976, Pat. No. 4,091,936.
This application Jan. 5, 1978, Ser. No. 867,083
Int. Cl.[2] B66C *23/66, 23/68*
U.S. Cl. 212—270 **6 Claims**



1. A method of extending a boom assembly, said method comprising the steps of pivotally connecting the inner end portion of a first boom extension section to an outer end portion of the boom assembly with the first boom extension section disposed adjacent to one side of the boom assembly, pivotally connecting the inner end portion of a second boom extension section to the outer end portion of the first boom extension section while the first and second boom extension sections are disposed adjacent to the one side of the boom assembly, said step of pivotally connecting the inner end portion of the second boom extension section to the outer end portion of the first boom extension section includes the steps of guiding movement of the second boom extension section relative to the first boom extension section by moving a roller connected with one of the boom extension sections along a track connected with the other boom extension section, pivoting the first boom extension section relative to the boom assembly to move the first boom extension section from the location adjacent to the one side of the boom assembly to a position extending outwardly from the boom assembly, carrying the second boom extension section on the first boom extension section in a side-by-side relationship therewith while performing said step of pivoting the first boom extension section, and pivoting the second boom extension section relative to the first boom extension section to move the second boom extension section away from the position beside the first boom extension section to a position extending outwardly from the first boom extension section after performing said step of pivoting the first boom extension section.

4,222,493

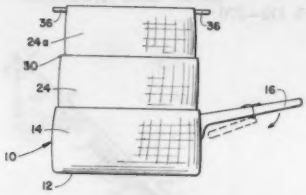
COOKWARE

Conchetta Friedman, 2211 W. Morrow Dr., Phoenix, Ariz. 85027

Filed Apr. 29, 1976, Ser. No. 681,384
Int. Cl.[2] A47J *27/60*
U.S. Cl. 220—8 **6 Claims**

1. A vessel adapted to increase in depth, comprising a primary vessel having a base portion, side walls and an open mouth area defined by a rim there around, said side walls disposed forming a circle, said primary vessel having a predetermined internal diameter defined by a circular internal wall, said circular internal wall including a first upwardly extending arcuate flange depending therefrom and defining a U shaped channel, said first upwardly extending arcuate flange extend-

ing partially along said circular internal wall, a second inwardly extending flange member projecting from said internal wall and disposed above said U shaped channel, at least one open ended walled sleeve member having an external surface diametrically smaller than said internal diameter, said external surface disposed forming a circular surface, said external surface including a first downwardly extending arcuate flange depending therefrom, said first downwardly extending arcuate flange extending partially along said external surface, said two flanges adapted to releasably engage one another upon the relative rotation of said primary vessel and said sleeve to each other, whereby said sleeve is supported by said primary vessel.



4,222,494

CONTAINER

Harry W. Lee, Jr.; Joseph W. Wallace, and James M. Woolard, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 709,903, Jul. 29, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,475

Int. Cl.[2] B65D *7/42*

U.S. Cl. 220—66 **47 Claims**

1. A container having a cylindrical side wall and a bottom wall closing one end thereof and comprising:

a frustoconical portion having one end thereof directly attached to said side wall;

a first semi-torroidal portion having one end thereof directly attached to the other end of said frustoconical portion;

a second semi-torroidal portion having one end thereof directly attached to the other end of said first semi-torroidal portion; and

a central bottom-closing portion directly attached to the other end of said second semi-torroidal portion.

4,222,495

AUTOMATIC SCREW FEEDING APPARATUS

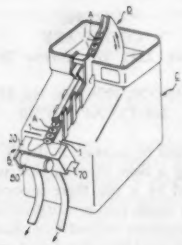
Atsunobu Kaneko, Ayabe, Japan, assignor to Nitto Seiko Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 23, 1979, Ser. No. 32,715

Claims priority, application Japan, Apr. 24, 1978, 53-49086; Apr. 24, 1978, 53-49087; Apr. 24, 1978, 53-49088

Int. Cl.[3] B65G *59/06*

U.S. Cl. 221—68 **13 Claims**



1. An automatic screw feeding apparatus for feeding continuously entering screws toward systems displaced from the position of said entering which comprises:

a main body provided with guide groove having a horizontal bottom wall extending in lateral and horizontal direction with respect to the entering direction of the screws, said bottom wall being formed with a screw passing hole extending therethrough in a vertical direction;

a screw longitudinal feeding member provided on the upper side of said main body, and moving and guiding the entering screws in a longitudinal direction approximately parallel to the entering direction of the screws up to a position directly above said screw passing hole of said main body;

a screw lateral feeding member provided on the upper side of said screw longitudinal feeding member, and moving and guiding the entering screws up to the position directly above said screw passing hole of said main body through reciprocation in the lateral and horizontal direction; and

a screw distributing member slidably accommodated in said guide groove of said main body to be disposed between it and said screw longitudinal feeding member for lateral reciprocating movement together with said screw lateral feeding member, and provided with screw dropping hole so arranged as to guide the screws moved by said screw feeding member toward said screw passing hole of said main body, said screw longitudinal feeding member is provided with a screw inlet which guides stem portions of the entering screws in the longitudinal direction, a passage communicated with said screw inlet and inclined with respect to the entering direction of the screws, and a screw dropping hole extending therethrough in the vertical direction to correspond to said screw dropping hole of said main body at the end portion of said passage, said screw lateral feeding member being provided with a screw inlet extending therethrough so as to guide the stem portions of the entering screws in the longitudinal direction and a screw dropping hole extending therethrough in the vertical direction at the end portion of said screw inlet.

4,222,496

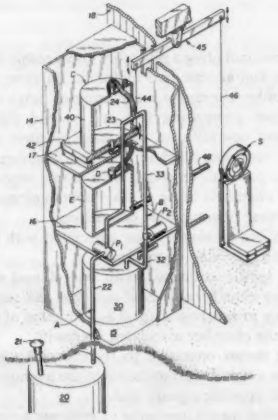
CONTINUOUS OUTFLOW, WEIGHT-MEASURING BLENDER

Rick E. Start, Grand Rapids; Bert Woldring, Hudsonville, and Cliff Parker, Grand Rapids, all of, assignors to Fabri-Coate Company, Inc., Grand Rapids, MI

Filed Jan. 22, 1979, Ser. No. 5,269

Int. Cl.[3] G01G *17/04*

U.S. Cl. 222—16 **1 Claim**



1. Apparatus for providing a continuous supply of a weight

measured blend of at least two constituent liquids to a main production facility building, said apparatus comprising:

a free standing tower having at least an uppermost level and a level immediately below said uppermost level; a weight-measuring tank contained within said uppermost level having at least one input and at least one output; weighing means including a scale having an indicator undergoing excursion disposed interior said main production facility building and a weighing platform disposed in said uppermost level, said weight-measuring tank supported on said weighing platform, said weighing platform operatively connected to said scale so that said indicator undergoes excursion upon said weight measuring tank receiving increasing contents; a blend-holding reservoir disposed in said level immediately below said uppermost level in substantial vertical alignment with said weight-measuring tank for receiving gravitationally flowing output of said weight-measuring tank; a dump valve and included conduit between said blend-holding reservoir and weight-measuring tank for releasing said liquid constituents to flow by gravity from said weight-measuring tank whereby blended liquid constituents enter said blend-holding reservoir; means for opening said dump valve upon said reservoir having blend content below a predetermined amount; at least first, second, and third position indicators on the face of said scale for generating respective sequential first, second, and third output signals responsive to the excursion fo said indicator on said scale from said first position to said third position; a first constituent liquid input system having a first pump for inputting a first constituent liquid to said weight-measuring tank; a second constituent liquid input system having a second pump for inputting a second constituent liquid to said weight-measuring tank; means for causing said first signal to actuate said first constituent liquid input system to input said first constituent liquid to said weight-measuring tank; means for causing said second signal to actuate cessation of inputting of said first constituent liquid and commencement of inputting of said second constituent liquid; first means for causing said third signal to actuate cessation of inputting from said second constituent liquid input system; second means for causing said third signal to actuate a pumps not ready circuit to prevent actuation of the pumps upon the reverse excursion of said indicator from and between the third position to the first position: and means connected to said first and third indicators for deactivating said dump valve during inputting from said respective first and second constituent liquid input systems, whereby partially blended constituents cannot be released to said reservoir, at least one of said position indicators on said scale being removeably attachable to said scale to generate a signal at different positions of excursion of said indicator on said scale whereby the blending of constituents in said free standing tower is remotely controlled from said scale interior of said main production facility building.

4,222,497

SYSTEM AND METHOD FOR MONITORING AND MAINTAINING A PREDETERMINED CONCENTRATION OF MATERIAL IN A FLUID CARRIER

William A. Lloyd, San Jose; Herman Wong, Los Altos Hills, and Keith E. McFarland, Woodside, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

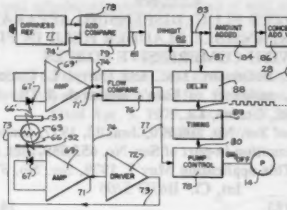
Filed Mar. 22, 1976, Ser. No. 669,205

The portion of the term of this patent subsequent to Jul. 16, 1995, has been disclaimed.

Int. Cl.[3] B23Q *35/00*

U.S. Cl. 222—57 **25 Claims**

1. In a system for monitoring and maintaining a predetermined concentration of a material carried in a fluid body comprising fluid receiving flow cell means, means for feeding the material and fluid together into and out of said flow cell means, means for establishing first and second volumetric conditions taken from said fluid body in said flow cell means, energy source means for transmitting energy via fluid in said flow cell means during each of said conditions, and means for detecting the degree of transmission through said flow cell means to define first and second levels of transmission via said flow cell means under said establsihed conditions, means for correlating



one of said levels relative to the other to provide a first measure of the concentration of said material in said fluid body, means for establishing a predetermined standard measure for a desired concentration of said material in said fluids, and means for adding additional material into said body in response to detecting a predetermined disparity between said first and said standard measures.

4,222,498

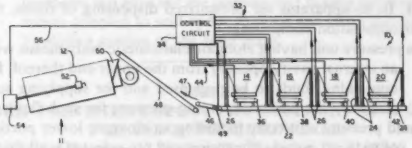
CONTROL SYSTEM FOR AGGREGATE DELIVERY SYSTEM

James D. Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Jan. 17, 1979, Ser. No. 4,040

Int. Cl.[3] B28C *7/04*

U.S. Cl. 222—58 **2 Claims**



1. An apparatus for delivering liquid asphalt from a storage tank and aggregate material from a plurality of feed bins containing various grades of aggregate to a drum mix plant comprising:

individual weighing means for continuously measuring the weight of each of said feed bins and aggregate material contained therein;

individual emptying means for removing aggregate material from each of said feed bins so as to reduce the weight of each of said feed bins and aggregate materials therein measured by said weighing means at a rate corresponding to a desired rate of removal of aggregate material assigned to each of said feed bins;

conveying means for delivering aggregate removed from said feed bins to said drum mix plant;

control means responsive to said weighing means measuring a reduction in the weight of any of said feed bins and aggregate therein at other than said desired rate for said any of said feed bins for adjusting said emptying means to maintain said desired rate of weight reduction from said any of said feed bins; and

said control means responsive to said weighing means for delivering liquid asphalt to said drum mix plant at a rate corresponding to the weight and composition of aggre-

gate delivered to said drum mix plant by said conveying means.

4,222,499

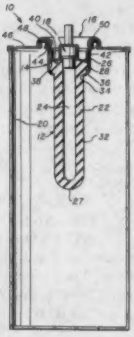
PRESSURIZED FLUID DISPENSING APPARATUS HAVING EXPANSIBLE BLADDER HELD IN PLACE WITH COMPRESSIVE FORCES

Harold D. Lee, Beaumont, Tex., and Darryl L. Carimi, New Orleans, La., assignors to Kain's Research & Development Company, Inc., Gretna, La.

Continuation of Ser. No. 808,970, Jun. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,659, Jun. 4, 1976, abandoned. This application May 7, 1979, Ser. No. 37,931

Int. Cl.³ B67D *5/06*

U.S. Cl. 222—183 **14 Claims**



1. In an apparatus for pressurized dispensing of fluids, the subcombination comprising:

a pressure unit having elongate elastomeric body means with an internal cavity opening from the upper end thereof, for containing fluids to be dispensed and for supplying substantially the entire dispensing pressure for such fluids;

said pressure unit body including an elongate lower portion of reduced outside dimension and pre-selected wall thickness and an upper portion of enlarged outside dimension and substantially greater wall thickness than said lower portion;

support means engaging the lower outside surface of said enlarged portion for supporting said pressure unit on said support means from said enlarged portion;

valve means sealably engaging said pressure unit and closing the opening into said internal cavity, for selectively dispensing fluids from said cavity;

sealing member means for supporting said valve means and applying a force to compress said enlarged portion between said valve means, said support means and said sealing member means to effect a sealing of said opening and prevent flow of fluid from said internal cavity,

said sealing member means and said support member means being separate parts initially vertically movable with respect to each other to effect said compression of said enlarged portion therebetween and being deformable whereby said sealing member means, support member means and valve means may be held in sealing relationship to said enlarged portion by crimping said sealing member means and said support member means,

one of said sealing member means and support member means including means for attachment of said subcombination to a container.

4,222,500

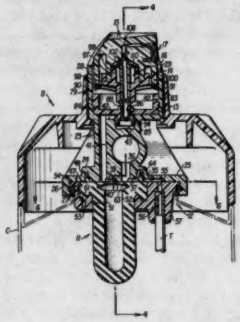
NON-PROPELLANT, DURATION SPRAY DISPENSER WITH POSITIVE SHUT OFF VALVE

Nicholas G. Capra, East Hanover, N.J., and Roy Hammett, Miami, Fla., assignors to James D. Pauls, Limited, Miami, Fla.

Continuation-in-part of Ser. No. 862,551, Dec. 20, 1977. This application Jul. 24, 1978, Ser. No. 927,274

Int. Cl.² B05B *11/02*

U.S. Cl. 222—207 **22 Claims**



1. An aerosol dispenser, comprising: a container for material to be dispensed, said container having a side wall, a closed end and an open end; and dispensing means carried by the container at the open end thereof and having an outlet for dispensing material from the container, said dispensing means including manually operated expansible chamber means for pressurizing the material, an expansible accumulating chamber for accumulating a quantity of the material under pressure from the expansible chamber means, and discharge means for discharging the pressurized material from the accumulating chamber said discharge means including a manually operated valve for releasing pressurized material from the accumulating chamber, and a snap-acting positive shut off valve separate from the accumulating chamber and operative in response to pressure of material released by the manually operated valve to abruptly open and enable discharge of material to atmosphere when the pressure rises above a predetermined minimum and to terminate flow when the pressure falls below a predetermined minimum.

4,222,501

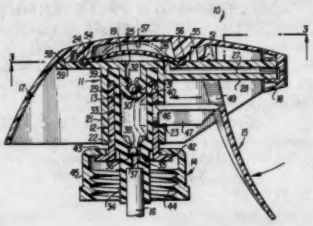
DUAL CHAMBER, CONTINUOUS ACTION DISPENSER

Roy Hammett, Miami, Fla., and Nicholas G. Capra, East Hanover, N.J., assignors to James D. Pauls and J. Claybrook Lewis and Associates, Limited, Miami, Fla.

Filed Jul. 24, 1978, Ser. No. 927,563

Int. Cl.² B05B *11/00;* **F04B** *43/08*

U.S. Cl. 222—207 **4 Claims**



1. A trigger operated dispenser, comprising: a body having means thereon for connection to a container of material to be

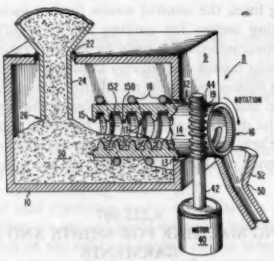
dispensed; a resiliently yieldable pumping chamber carried by the body for receiving material from the container and pressurizing it; a trigger actuator pivotally carried by the body and having a plunger extending into the body into engagement with the pumping chamber to actuate the pumping chamber to pressurize material therein; and an expansible accumulating chamber carried by the body in communication with the pumping chamber to receive pressurized material from the pumping chamber as the material is being pressurized by the pumping chamber for discharge from the dispenser, said accumulating chamber enabling a continuous discharge of material from the dispenser by providing a reservoir of material for discharge while the trigger actuator is being moved to enlarge the pumping chamber on an intake stroke of the trigger; a discharge nozzle on the body for receiving material from the accumulating chamber; and said accumulating chamber having an inlet from the pumping chamber and an outlet to the nozzle, and including a flexible, resiliently yieldable diaphragm extending across the pumping chamber, a peripheral portion of the diaphragm extending across the outlet from the accumulating chamber and comprising an outlet valve means, said peripheral portion disposed against said outlet in closing relationship thereto when the pressure of material in said accumulating chamber is below a predetermined minimum, and an outer peripheral part of the diaphragm being secured to the body.

4,222,502

METER AND DISPENSING SYSTEM FOR ABRASIVE MATERIALS

Nicholas F. Gubitose, Moosic; Malcolm R. Schuler; Harold R. Ronan, Jr., both of Mountaintop, all of Pa., and Richard E. Novak, East Windsor, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1978, Ser. No. 956,662
Int. Cl.[3] G01F *11/20*
U.S. Cl. 222—240 **8 Claims**



1. A material metering and dispensing system for accurately metering and dispensing particles and powders, said system comprising:

container means for storing the material to be metered and dispensed;

a tubular material transport member having a length, an interior surface, an exterior surface, an input end within the boundaries of said container means and an output end outside said container means;

thread means along the interior surface of said tubular member and fixed thereto for causing material within said member to transfer from said input end to said output end in a quasi-rectilinear manner in response to rotation of said tubular member about an axis substantially parallel to the length of said tubular member;

discharge flow smoothing means comprising:

a chamfer on the interior surface of said tubular means at the output end thereof;

a threadless portion of said interior surface of said tubular means adjacent said chamfer, said threadless region having an interior diameter which is substantially the same as the root diameter of the threads of said thread means; and

portions of said thread means in the vicinity of said threadless section having ridges of reduced height as compared to the remainder of said thread means; and

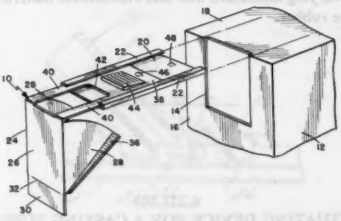
means for preventing localized portions of the material to be fed from simultaneously contacting said exterior surface of said tubular member and a wall of said container means.

4,222,503

POURING SPOUT ATTACHMENT FOR A CONTAINER

William H. Myers, 1056 Meade St., San Diego, Calif. 92116

Filed Apr. 9, 1979, Ser. No. 27,991
Int. Cl.[3] B65D *43/18*
U.S. Cl. 222—508 **8 Claims**



1. A pouring spout attachment for a container having a side, a top and a spout receiving opening in the side extending downwardly from the top, the spout attachment comprising:

a spout of generally U-shaped cross section having a hinge tab for attachment to the container side below the opening therein, with the spout extending through and being a close fit in the opening;

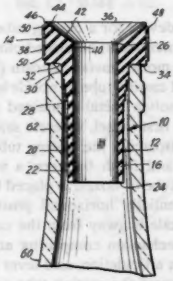
a slide plate having means for slidable mounting on the container top adjacent the opening and having connecting means coupled to said spout to open and close the spout by sliding motion of the slide plate.

4,222,504

DRIP PREVENTIVE SPOUT PARTICULARLY ADAPTED FOR USE IN POURING WINES

Bernard Ackerman, 17 Stirling Ct., Metuchen, N.J. 08840

Filed Apr. 21, 1978, Ser. No. 898,873
Int. Cl.[2] B65D *5/74*
U.S. Cl. 222—569 **6 Claims**



1. A removable and reusable drip preventive spout for liquid containers particularly adapted for use with wine bottles comprising an elongated stem and a superposed crown each having a passageway extending therethrough, the passageway in the crown extending outwardly forming a conical portion therein,

a sharp pouring edge defined by the intersection of the upper edge of the conical portion with an outer surface of the crown, the surface of the conical portion forming an angle with a horizontal plane of approximately 45 degrees, the length of the shortest distance between upper and lower edges of the conical portion measured along the surface thereof at any location being not less than the length of the smallest radius of the passageway in either said stem or crown to facilitate controlled pouring of the liquid contents of the container, said stem and crown being integrally fabricated entirely of an elastomeric material and having the intersection of the stem and the crown rounded forming a radius to prevent tearing of the spout during removal, the outer side wall of the stem at the upper portion thereof forming a plurality of substantially annular flat surfaces of increasing diameters, said diameters increasing in size travelling upwardly towards said crown to enable the spout to form a liquid tight fit with the neck of liquid containers of varying diameters, and said elastomeric material being a silicone rubber.

4,222,505

ACTUATING DEVICE FOR A CASTING TUBE OR NOZZLE

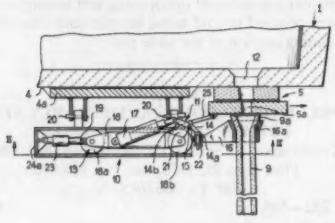
Jean-Charles Daussan; Gérard Daussan, both of Metz, and André Daussan, Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed Nov. 15, 1978, Ser. No. 962,029

Claims priority, application France, Nov. 29, 1977, 77 35874

Int. Cl.[2] B22D *41/08*

U.S. Cl. 222—600 **10 Claims**



1. An actuating device for a casting tube or casting nozzle, said device being intended to be placed close to the bottom of a vessel containing molten metal, beneath the casting outlet of said vessel, and said casting tube or nozzle being intended to be immersed in the molten metal contained in a second vessel placed beneath the first vessel, wherein said device comprises a mechanism for displacing the casting tube or nozzle in pivotal motion back and forth between a vertical position in which said casting tube or nozzle is placed beneath the casting outlet and a substantially horizontal position in which said casting tube or nozzle is away from the casting outlet of the first vessel, said mechanism comprising an articulated lever, said lever having an articulation, said lever supporting removably at one end thereof the casting tube or nozzle, the other end of said lever being connected to an actuating device for displacing said lever in pivotal motion about its articulation, the actuating device further comprising a translational displacement mechansim for displacing said casting tube or nozzle in a substantially horizontal plane, said translational displacement mechanism carrying said articulated lever.

4,222,506

MOLTEN STEEL OUTFLOW AUTOMATICALLY CONTROLLING DEVICE

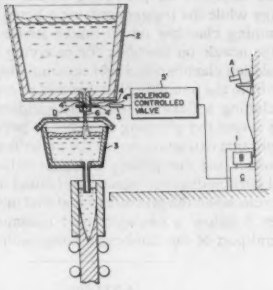
Tsutomu Sakashita, and Isao Yamazaki, both of Ibaragi, Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Nov. 15, 1977, Ser. No. 851,773

Claims priority, application Japan, Nov. 17, 1976, 51-138692

Int. Cl.[2] B22D *41/08*

U.S. Cl. 222—600 **5 Claims**



1. A device for controlling molten steel flowing out of a molten steel vessel through a nozzle provided thereon, comprising an infrared ray camera emitting a video signal for detecting infrared rays emitted by a stream of the molten steel and slag flowing out of the nozzle, control means operatively connected with the camera and including a color monitor for converting the wave length of the video signal sent from the camera into two different colors respectively for the molten steel and slag and for showing them in monitor picture images as scanning lines, the control means further including a signal discriminating means for making the two different picture images as discriminating signals by an area ratio thereof, and nozzle closing means operatively connected to the signal discriminating means and to the nozzle for closing the flow of the molten steel out of the vessel by closing the nozzle as determined by the discriminating means based on a predetermined value of the area ratio, whereby the nozzle is closed in response to the presence of slag in the flow from the nozzle.

4,222,507

FOLDING MACHINE FOR SHIRTS AND SIMILAR GARMENTS

Alf R. A. Bengtsson, Åkerbo 2, S-51020 Fritsla; John L. Carlborg, Åsen, S-52300 Ulricehamn, and Bengt R. E. Ewertsson, Roppelvägen 8, S-51300 Fristad, all of Sweden

Filed Oct. 10, 1978, Ser. No. 950,156

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745517

Int. Cl.[2] A41H *33/00*

U.S. Cl. 223—37 **5 Claims**

1. A garment folding machine of the type comprising a support plate which has opposite side edges and which supports an upper central portion of a garment in flat, front-down condition, a cover plate movable to and from an operative position in which said cover plate flatwise overlies said support plate and a portion of a garment supported thereon, and a pair of side folding plates, one for each side edge of the support plate, each having a starting position in which the side folding plate has an inner side edge near its side edge of the support plate and in which the side folding plate supports a longitudinally extending side portion of a garment, said side folding plates being movable substantially edgewise towards one another out of their starting positions to fold said side portions of the garment into overlapping relationship over the cover plate

and the upper central portion of the garment, said garment folding machine being characterized by means for preventing said side portions of a garment from being disarranged from their overlappingly folded relationship during return movement of the side folding plates to their starting positions and for establishing and maintaining a transverse tensioning of the upper central portion of the garment whereby the same is caused to be flat and smooth, said characterizing means comprising:

A. cooperating fixed and movable elongated clamping means,

(1) said fixed clamping means

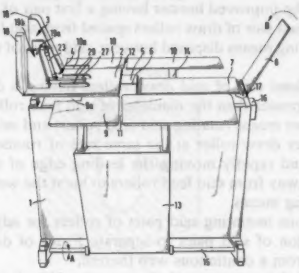
(a) being fixed on said cover plate and

(b) having an elongated upper surface area

(i) which extends lengthwise substantially parallel to said side edges of the cover plate along a substantial portion of the length of the cover plate, and

(ii) which is substantially parallel to and spaced above the upper surface of the cover plate;

(2) said movable clamping means being confined to movement downwardly to and upwardly away from an operative position in which said movable clamping means extends lengthwise substantially parallel to said fixed clamping means and in which an elongated bottom surface area on said movable clamping means that has a lengthwise extension substantially equal to that of said fixed clamping means is in substantially parallel and closely adjacent relationship to the upper surface of the cover plate and at a level below that of said surface area on the fixed clamping means; and



(3) one of said clamping means comprising a pair of elements that are spaced small distances laterally to opposite sides of the other clamping means when the movable clamping means is in its operative position, so that overlappingly folded-over side portions of a garment confined between said clamping means extend undulatingly transversely across said surface areas to be foreshortened in the lateral direction for maintenance of lateral tension on the upper central portion of the garment; and

B. actuating means connected with said movable clamping means for moving the same to and from its operative position.

4,222,508

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 683,419, May 5, 1976, Pat. No. 4,106,680. This application Aug. 11, 1978, Ser. No. 933,105

Int. Cl.[2] B60R *9/00*

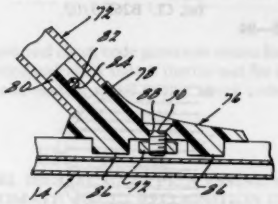
U.S. Cl. 224—324 **5 Claims**

1. In combination with an automotive vehicle having a body with an exterior horizontal surface such as a trunk lid or a roof, an article carrier system for supporting and securing articles on said exterior surface and comprising a pair of elongated slats on said surface in respective positions on opposite sides of the longitudinal axis of the body and extending substantially parallel to the longitudinal axis of the body,

means permanently securing said slats to said body in said positions,

said slats being substantially rectangular in vertical cross section with a width substantially greater than the height of the section and presenting a low profile on said surface,

the tops of said slats being substantially flat and parallel to said horizontal surface and providing means on which articles may be rested and supported above said surface, each of said slats being formed with a longitudinally extending clamping area which is coextensive thereof, each of said clamping areas comprising a longitudinally extending channel within said each of said slats accessible through a relatively narrow slot in the upper side thereof;



a pair of longitudinally extending side rails arranged parallel to said slats and disposed one above each of said slats, each of said side rails having a pair of support members arranged one adjacent each end thereof,

said support members being removably mounted upon said slats and including manual screw operated clamping means cooperable with said clamping areas of said slats for temporarily clamping said support members to said slats in selected fixed longitudinal positions, said clamping means including a retaining element slidable within the associated said channel and a screw operated element for causing the associated retaining element to move toward and away from a clamping position within said associated channel.

4,222,509

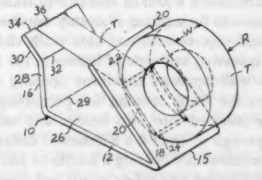
ADHESIVE TAPE DISPENSER

Clayton K. Smith, 45 S. Edgewood, Grosse Pointe Shores, Mich. 48236

Filed Mar. 20, 1979, Ser. No. 22,288

Int. Cl.[3] B26F *3/02*

U.S. Cl. 225—77 **8 Claims**



1. A dispenser for adhesive tape from a roll thereof spirally wound in a hollow cylindrical body upon a tubular core, said dispenser comprising

a substantially flat rectangular base portion adapted to rest upon a supporting surface,

an upwardly-inclined tape roll holding portion rising at an acute angle from one end of said base portion in overhanging relationship thereto,

said roll-holding portion having an upwardly-elongated slot therein shaped to receive and hold a conventional adhesive tape roll,

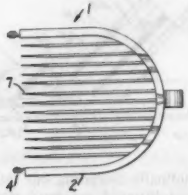
and an upstanding tape severing portion rising from the opposite end of said base portion and having a tape-severing edge thereon in the upper part thereof.

4,222,510

MUFFIN SEPARATOR AND MUFFIN HOLDER AND SAFETY GUARD

Aliki-Niki Kouloumbini, 4515 30th Ave., Astoria, N.Y. 11103, and Ernest E. Anderson, 40 Chestnut St., Lakewood, N.J. 08701

Filed Dec. 18, 1978, Ser. No. 970,616
Int. Cl.³ B26F *3/02*
U.S. Cl. 225—94 **2 Claims**



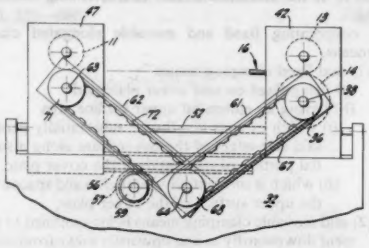
1. The combination of a muffin separator for separating English muffins or like bakery products into halves, and a muffin holder and safety guard for use with the muffin separator; wherein said muffin separator is comprised of a hinged pair of generally U-shaped open frames, said frames each having a respective pair of spaced frame arms hinged together for pivoting between a position with the pair of frames adjacent and coincident and a position with the pair of frames separated, a plurality of prongs extending from each of said U-shaped open frames generally paralled with the frame arms and terminating at the open end of the frame, and said plurality of prongs on each of said U-shaped open frames being oriented to extend parallel to said plurality of prongs on the other of said U-shaped open frames when said pair of frames are in the adjacent position; and wherein said holder and safety guard is comprised of a box-like member having a top wall and an opposite bottom wall spaced a distance slightly greater than a height of said pair of frames when said frames are in the adjacent position for permitting said pair of frames to be inserted smoothly between said top wall and said bottom wall with said pair of frames adjacent, a pair of side walls spaced a distance slightly greater than a width of said pair of frames for permitting said frames to be inserted smoothly between said pair of side walls, said top, bottom and side walls defining a front opening for receiving said pair of frames in the adjacent position, a back wall opposite the front opening and spaced a distance from the front opening for permitting said pair of frames to be inserted into said holder and safety guard to permit said prongs to extend a substantial distance thereinto, and means for releasably holding a muffin or like bakery product within said holder and safety guard and positioned so that insertion of said pair of frames into said holder and safety guard with a muffin held therein is effective to impale the muffin on the prongs of said pair of frames and withdrawal of said pair of frames releases the muffin which remains impaled on said prongs for subsequent separation into halves upon pivoting of said pair of frames and the pluralities of prongs thereon from the adjacent to a separated position, said top wall of said box-like member is hinged to permit access to the interior of said box-like member.

4,222,511

LOW NOISE BURSTER

Marlin A. Schueler, San Leandro, Calif., assignor to Swingline, Inc., New York, N.Y.

Filed Oct. 6, 1978, Ser. No. 949,019
Int. Cl.³ B26F *3/02*
U.S. Cl. 225—100 **3 Claims**



1. An improved burster having a first pair of feed rollers and a second pair of draw rollers spaced from said feed rollers with breaking means disposed between said pairs of rollers comprising

at least one of said draw rollers having a diameter that is greater than the diameter of said feed rollers,

drive means rotating said feed rollers and said larger diameter draw roller at the same rate of rotation for gripping and rapidly moving the leading edge of a web of paper away from said feed rollers to burst the web at said breaking means,

means mounting said pairs of rollers for adjustable separation of said pairs to separate forms of different lengths from a continuous web thereof,

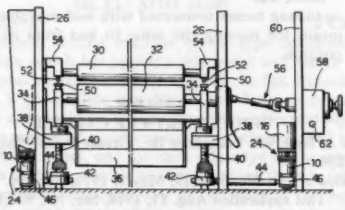
said drive means including a pair of like links, each of said links at one end being pivotally connected to the other of said links, a double pulley wheel, the axis of said double pulley wheel coinciding with the axis of pivot connection between said links, at least one roller of each of said first and second pairs of rollers having a shaft, each of said shafts having the outer end of one of said links pivotally mounted thereon, a pulley wheel on each of said shafts, and a belt connecting said double pulley wheel to each of said pulley wheels on said shaft.

4,222,512

DEVICE FOR CONTROLLING ROTARY MOTION

Aldo Bugnone, Via Bellini 2, Turin, Italy

Filed Jun. 2, 1978, Ser. No. 912,158
Claims priority, application Italy, Jun. 2, 1977, 68267 A/77
Int. Cl.³ B65H *17/20, 19/10, 19/22*
U.S. Cl. 226—181 **3 Claims**



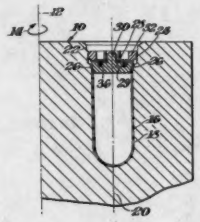
1. A device for controlling displacement of a drive roller into and out of engagement with a counter-roller including a driven movable member supporting said drive roller, a fixed member supporting said counter-roller, a high speed electric

motor having a driving shaft operatively connected to said driven movable member, a low speed electric motor comprised of a permanent magnet stepping motor having a shaft aligned with the shaft of said high speed motor, coupling means for interconnecting the shafts of the high speed motor and the low speed motor, said high speed motor and said low speed motor being selectively operable for causing sequentially a high speed movement and a low speed movement of said driven movable member toward said fixed member and switch means operatively associated with said fixed and movable members for causing a changeover from said high speed motor to said low speed motor as said drive roller approaches said counter-roller whereby said permanent magnet stepping motor will drive said drive roller into engagement with said counter-roller without shock.

4,222,513
CENTRIFUGE TUBE SEAL

Donald A. Webster, Fairfield; Lake H. Johnson, Newtown, and William A. Romanauskas, Southbury, all of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1978, Ser. No. 968,965
Int. Cl.² B04B *15/00*
U.S. Cl. 233—26 **8 Claims**



1. In a centrifuge rotor for centrifuging a sample in a flexible container having an open end and a first tapered plug for sealing said open end, said rotor having a rotational axis and a radially spaced cavity with a flared open end for said container, said cavity having an axis through said open end generally parallel to said rotational axis, and a retainer secured to said open cavity end for wedging the walls of the open end of said container between said plug taper and said flare, the improvement of:

a resilient member interposed on said cavity axis between said container and plug on the one hand and one of said cavity and retainer on the other, thereby to provide an axial force for maintaining said plug wedged in said container, said plug being movable relative to said retainer transversely of said cavity axis, thereby to maintain the open end of said container sealed.

4,222,514
DIGITAL TESTER

David S. Bass, Floral Park, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,122
Int. Cl.² G06F *11/00*; G01R *31/28*
U.S. Cl. 371—27 **11 Claims**

1. An apparatus for testing digital circuits comprising:

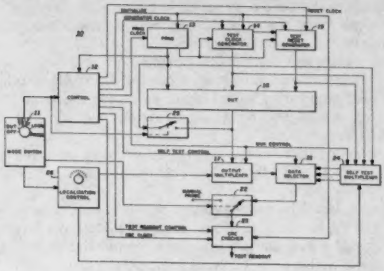
receptacle means for receiving said digital circuits for testing;

means coupled to said receptacle means for generating a sequence of pseudorandom numbers for transfer to the input data terminals of said digital circuits;

means coupled to said pseudorandom number generator means and said receptacle means for generating pseudorandom clock and reset pulses for transfer to the clock and reset terminals of said digital circuits;

means coupled to said receptacle means for generating a check code in response to digital data transferred from the output terminals of said digital circuits; and

control means coupled to said pseudorandom number generator means, said pseudorandom clock and reset generator

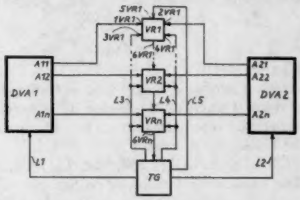


means, and said check code generator means for supplying initialization and clock signals thereto and for supplying a check code readout signal to said check code generator means.

4,222,515
PARALLEL DIGITAL DATA PROCESSING SYSTEM WITH AUTOMATIC FAULT RECOGNITION UTILIZING SEQUENTIAL COMPARATORS HAVING A DELAY ELEMENT THEREIN

Horst Strelow, Cremlingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,003
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729362
Int. Cl.² G06F *11/08*
U.S. Cl. 371—68 **3 Claims**



1. A digital data processing system comprising:

two processors each receiving identical input data and independently processing the data in a series of processing steps, each said processor having a plurality of sequential outputs, with corresponding outputs from each processor comprising a plurality of sequential output pairs;

a joint pulse current supply connected to each processor for supplying respective control signals thereto, one of said control signals being displaced in time by at least one processing step with respect to the other control signal and being otherwise identical thereto;

said joint pulse current supply further having a monitoring signal output at which a monitoring signal consisting of successive pulses each having a temporal position corresponding to a processing step in said processors is produced;

said joint pulse current supply further generating two identical clock pulse signals at respective first and second clock pulse outputs;

a plurality of comparators each connected to a respective one of said output pairs and each having a monitoring signal input and a monitoring signal output, said plurality

including a first comparator having its monitoring signal input connected to said monitoring signal output of said joint pulse current supply, and including a last comparator having its monitoring signal output connected to said joint pulse current supply, and including a remainder of comparators connected in series between said first and last comparators through the respective monitoring signal inputs and outputs;

each comparator further comprising

a transistor amplifier having a control electrode serving as said monitoring signal input, an output electrode serving as said monitoring signal output, and a signal electrode,

a four-rectifier bridge connected directly to said signal electrode and through a resistor to said output electrode,

a first flip-flop cell having a non-inverted output connected to one side of said rectifier bridge and having a signal input, and a pulse input connected to said first clock-pulse output of said joint pulse current supply,

a second flip-flop cell having an inverted output connected to the other side of said rectifier bridge and having a signal input connected to one of said processor outputs forming a sequential output pair, and a pulse input connected to said second clock pulse output of said joint pulse current supply,

a delay element having an input connected to a processor output forming the other of a processor output pair having a connection to said second flip-flop cell, said delay element having an output connected to the signal input of said first flip-flop cell and transmitting a signal thereto which is delayed by a number of proccessing steps equal to the number of processing steps by which said control signals are displaced;

each said comparator connected to a processor output pair generating an enabling monitoring signal at its monitoring signal output if said pair is comprised of opposite logic states and generating a disabling monitoring signal if said pair is comprised of like logic states, said disabling monitoring signal acting to cease operation of said joint pulse current supply.

4,222,516

STANDARDIZED INFORMATION CARD

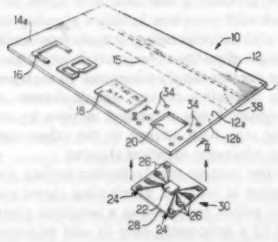
Bernard Badet, Rosny-sous-Bois; Francois Guillaume, St Leu la Foret, and Karel Kurzweil, Eaubonne, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Continuation of Ser. No. 751,954, Dec. 17, 1976, abandoned. This application Jan. 18, 1979, Ser. No. 4,588

Claims priority, application France, Dec. 31, 1975, 75 40361

Int. Cl.[2] **G06K** *19/06;* **B23K** *1/20;* **G06K** *7/06*

U.S. Cl. 235—492 **47 Claims**



1. A standardized information card comprising: a sheet having a predetermined surface area and a predetermined maximum thickness; said sheet having a top face, a bottom face and reference data on said top face, an integrated circuit assembly comprising a substrate having a surface area and a thickness substantially smaller than said predetermined surface area and said predetermined maximum thickness of said sheet, respectively, and an electronic device carried on at least one major surface of said substrate, said electronic device having a plurality of terminals on a predetermined major surface area and an array of conductors which extends from said terminals toward terminal areas adjacent the peripheral portion of said substrate and which are connected with respective terminal areas; said sheet including a cavity of an area substantially greater than said predetermined major surface area of said electronic device for said substrate with said electronic device and said array of conductors, said cavity including a chamber for said device, said substrate being disposed against one face of said sheet and said card having electrical terminals corresponding to said respective terminal areas of said array of conductors on said substrate and aperture means adjacent said cavity for accessing to said respective terminal areas.

4,222,517

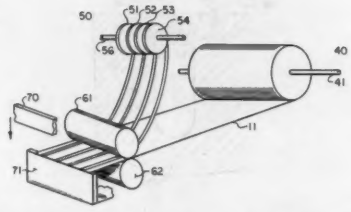
MAGNETIC MARKER

Robert H. Richardson, Melbourne, Fla., assignor to Samuel Cornelious Evans, Smyrna, Ga.

Filed Sep. 18, 1978, Ser. No. 943,529

Int. Cl.[2] **G06K** *19/06;* **G08B** *13/14;* **G01D** *15/24*

U.S. Cl. 235—493 **17 Claims**



1. A method of manufacturing an elongated marker formed of a first ferromagnetic material which is capable of generating harmonic frequencies when interrogated with a magnetic field of fundamental frequency, and a second ferromagnetic material which controls the state of the first material for enabling or disabling the harmonic signal when interrogated, said method of manufacture comprising the steps of:

A. Positioning at least two elongated relatively narrow strips of the second material generally parallel with the longitudinal axis of a relatively wide ribbon of the first material;

B. coupling said elongated strips of the second material to said ribbon of the first material; and

C. cutting said ribbon of the first material, and said strips of the second material coupled thereto, generally adjacent an end thereof and across said longitudinal axis, thereby forming the elongated ferromagnetic marker from a narrow section of the width of said ribbon of said first material.

4,222,518

METERING SYSTEM

Luther G. Simjian, Lago Mar Pl., 1750 S. Ocean La., Fort Lauderdale, Fla. 33316

Filed Oct. 19, 1978, Ser. No. 952,637

Int. Cl.[2] **G06F** *15/20;* **G06K** *17/00;* **H04Q** *3/00*

U.S. Cl. 235—375 **10 Claims**

1. A metering system of the postage meter type or similar type comprising:

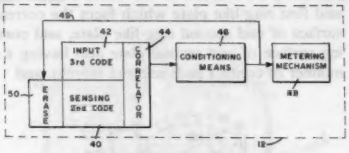
a metering device adapted to receive a code bearing means provided with code data;

input means coupled to said metering device for providing

input data having a predetermined relation to the code data of said code bearing means;

means associated with said metering device for sensing the code data of said code bearing means and said input data and in response to said code data of said code bearing means and said input data being in predetermined correlation causing said metering device to be conditioned for being updated, and

cancelling means associated with said metering device for rendering the code bearing means entirely or partially unuseable for reuse responsive to said metering device having been updated.



4,222,519

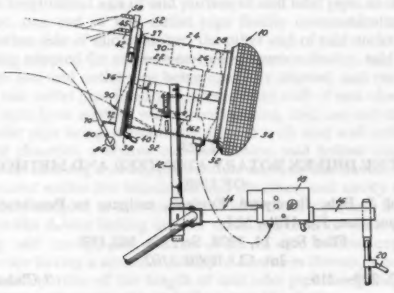
METHOD AND MACHINE FOR MAKING ARTIFICIAL SNOW

Everett F. Kircher, Boyne Falls, and James L. Dilworth, Petoskey, both of Mich., assignors to Boyne Mountain Lodge, Inc., Boyne Falls, Mich.

Continuation of Ser. No. 876,754, Feb. 10, 1978, abandoned, which is a division of Ser. No. 742,785, Nov. 18, 1976, Pat. No. 4,105,161. This application Sep. 17, 1979, Ser. No. 76,256

Int. Cl.³ F25C *3/04*

U.S. Cl. 239—14 **5 Claims**



1. Snow making apparatus comprising a blower which includes a ducted fan for generating in ambient air which is at or below a temperature of 32° F. a substantially unidirectional high-volume air stream at substantially atmospheric pressure and having linear flow as distinguished from helical or turbulent flow so as to project air stream into a zone overlying an area of the ground on which snow is to be deposited, water spray means including a manifold and a plurality of water spray nozzles disposed in an arcuate array for directing a flow of bulk water in spary form from externally of said air stream into said air stream as said air stream exits said blower from a circumferentially spray zone disposed around less than the entire periphery of said air stream so as to define a gap in the lower portion of said periphery between ends of said arcuate nozzle array, deflector means disposed to impart an upward deflection to a lower portion of said air stream upstream of water flow entry, and means for directing a flow of seed crystals into said air stream through said gap from beneath said air stream and downstream of said deflector means, said flow of water spray and seed crystals being oriented relative to the direction of travel of said air stream such that said flows converge and intermix in said air stream downstream of the respective points of entry of said flows into said air stream.

4,222,520

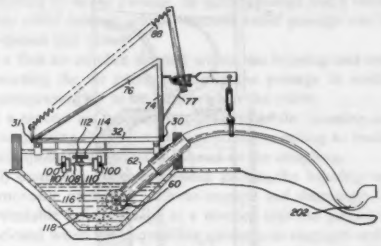
IRRIGATION MACHINE

Leland J. Melcher, 10835 Kalamath, Northglenn, Colo. 80234

Filed Mar. 12, 1979, Ser. No. 19,485

Int. Cl.² A01G *25/09*

U.S. Cl. 239—70 **14 Claims**



1. A mobile irrigating machine for use along a water-carrying ditch, comprising:

(a) a framework;

(b) wheel means for mobilly supporting the framework along the ditch;

(c) timer means for determining the passage of preselected time intervals;

(d) motive means responsive to said timer means for moving the irrigating machine a predetermined distance along the ditch at the conclusion of one of said intervals;

(e) a plurality of siphon tubes carried by said framework, each having an inner end adapted to be submerged in the ditch water and an outer end adapted to extend over the side of the ditch to supply ditch water to adjacent land;

(f) selectively actuatable water impeller means in the inner end of each siphon tube for forcing water through the tube;

(g) lifting means responsive to the timer means for elevating the outer end of the siphon tubes above the inner end thereof to unprime the tubes approximately when the motive means is starting a movement of the machine; and

(h) activating means responsive to said timer means for actuating said water impeller means to prime the siphon tubes after the motive means has completed a movement of the machine.

4,222,521

APPARATUS FOR CLEANING OBJECTS BY MEANS OF A JET OF LIQUID

Gert Nielsen, Cratloe, Northern Ireland, assignor to Gerni A/S, Randers, Denmark

Filed Jan. 5, 1979, Ser. No. 1,085

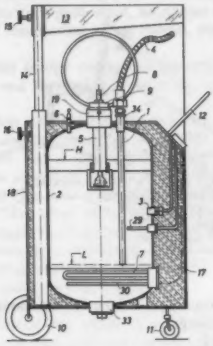
Claims priority, application Denmark, Mar. 6, 1978, 1001/78; Apr. 3, 1978, 1470/78; Fed. Rep. of Germany, Jul. 26, 1978, 7822360[U]

Int. Cl.² B05B *1/24*

U.S. Cl. 239—135 **7 Claims**

1. An apparatus for cleaning objects by means of a jet of liquid, and comprising a housing in the form of a pressure tank with a connecting branch for attachment to a hose with the opposite end of the hose adapted for connection to a spray gun and opening into the tank above a level receiving heating means for the liquid within the tank; a liquid filling pipe extending a short distance into the upper portion of the tank from the top closing wall portion thereof and terminating in a shutoff device at the inner end thereof; and means mounting the filling pipe to the top closing wall portion of the tank and including a stub pipe around the filling pipe and mounted to the top

closing wall portion of the tank; a threaded screw cap in the stub pipe and having a joint seal therewith and closing the outer end of the filling pipe and including a pipe extension therethrough provided with a non-return valve for connection to a source of air under pressure for introduction of pressurized air into the upper portion of the tank through the shutoff device; said screw cap and stud pipe providing mutually cooperating valve means by means providing a pressure relief channel in the pipe stub and a sealing ring positioned between the



pipe stub and screw cap such that the pressure relief channel is closed by the sealing ring when the screw cap is in completely screwed on seated position and is open to permit pressure relief passage through said channel when the screw cap is only slightly unscrewed from seated position; and an air outlet valve located within the upper portion of the tank and operable when subjected to a little superatmospheric pressure to open a connection between the upper portion of the tank and the pressure relief channel.

4,222,522

APPARATUS FOR APPLYING REFRACTORY MATERIAL ONTO THE INNER SURFACE OF A FURNACE

Sueki Kubo; Toshiro Watanabe; Masayuki Fujita; Tadahiko Matsuno, all of Kitakyushu, and Akira Morita, Ibaragi, all of Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Continuation-in-part of Ser. No. 788,941, Apr. 19, 1977, Pat. No. 4,120,260. This application Mar. 23, 1978, Ser. No. 889,176

Claims priority, application Japan, Apr. 19, 1976, 51-44759; Nov. 12, 1976, 51-136733; Nov. 16, 1976, 51-157018[U]; Nov. 24, 1976, 51-141422; Dec. 1, 1976, 51-161518[U]; Dec. 3, 1976, 51-145757; Dec. 3, 1976, 51-162941[U]; Dec. 8, 1976, 51-148048; Dec. 23, 1976, 51-173401[U]; Jan. 20, 1977, 52-6182[U]; Feb. 7, 1977, 52-12679; Feb. 15, 1977, 52-17727[U]; Mar. 28, 1977, 52-38147[U]

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.[2] B05B *3/14*; B05C *7/02*

U.S. Cl. 239—160 **3 Claims**

1. An apparatus for applying a refractory lining onto the inner surface of a furnace comprising:

(1) a transport car capable of moving on a floor,

(2) a spray pipe with a spray nozzle from which refractory material is sprayed onto the inner side of said furnace,

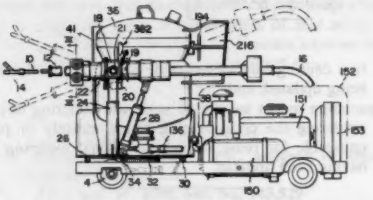
(3) a cylindrical body encasing said spray pipe slidably and rotatably,

(4) a support means located on said transport car for pivotally supporting said cylindrical body and said spray pipe,

(5) a control means comprising a pipe rotating means which imparts a rotation of said spray pipe relative to said cylindrical body and an automatic oscillating means which automatically effects a continuous rotary oscillation of said spray pipe within a predetermined angle relative to said cylindrical body, said automatic oscillating means comprising:

(a) first and second spaced apart ring-like plates mounted on said spray pipe adjacent to one end of said cylindrical body,

(b) a selected number of circumferentially equidistant contact pads secured to the outer circular surface of said first ring-like plate which faces the corresponding surface of said second ring-like plate, said corresponding surface of said second plate also having a selected number of contact pads secured thereto, and



(c) a limit switch provided with two contact levers mounted on said cylindrical body, each of which lever is adapted to contact the contact pads of one of said ring-like plates so as to switch on and off said limit switch and thereby effect the rotation of said outer pipe relative to said cylyndrical body in alternately opposed directions, and

(6) a tank storing refractory material therein and including a means for supplying said refractory material to said spray pipe from said tank.

4,222,523

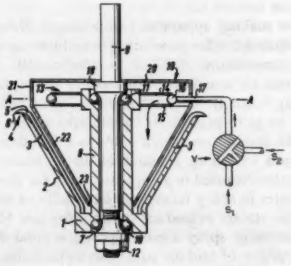
TURBINE DRIVEN ROTARY ATOMIZER AND METHOD OF USE

Edward J. Bals, Bromyard, England, assignor to Pennbrook Corporation, Far Hills, N.J.

Filed Sep. 14, 1978, Ser. No. 942,157

Int. Cl.[2] B05B *3/02*

U.S. Cl. 239—216 **7 Claims**



1. A rotary atomiser comprising a hollow truncated cone characterized in that it has a central axial shaft extending from the base of the cone through the interior of the cone, and a liquid jet driven turbine on the axial shaft, the turbine having an opening on the side nearest the cone so that liquid can flow from the turbine into the interior of the cone.

4,222,524

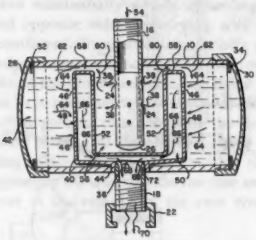
SHOWER HEAD MIXER

Robert Garcia, 1 Sadore La., Yonkers, N.Y. 10710

Continuation-in-part of Ser. No. 872,903, Jan. 27, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 27,978

Int. Cl.³ B05B 7/26

U.S. Cl. 239—315 **8 Claims**



1. A liquid mixing device comprising a mixing chamber, an inlet pipe, one end of said inlet pipe adapted for connection to a source of liquid, the other end of said inlet pipe passing through an opening located on one side of said chamber, said other end of said inlet pipe fixedly secured to the wall of said chamber so as to form a waterproof opening adjacent said opening, said other end of said inlet pipe having a first plurality of apertures for spraying said liquid within said chamber, said first plurality of apertures being located in a portion of the length of said inlet pipe adjacent said other end thereof and within said chamber, said portion of said inlet pipe extending normal to said one side of said chamber, said plurality of apertures for spraying said liquid only normally outwardly from the longitudinal axis of said portion of said inlet pipe, an outlet pipe, one end of said outlet pipe fluidly communicating to another side of said chamber, the other end of said outlet pipe being adapted for connection to a utilization device, said inlet pipe and said outlet pipe being coaxially aligned, said one end of said outlet pipe fixedly secured to said wall of said chamber so as to form another waterproof opening, said one end of said outlet pipe being substantially aligned with said wall defining said chamber, a hollow cup-like device, said hollow cup-like device defining a cavity therewithin, said cup-like device being secured within the interior of said chamber, said cavity being fluidly coupled to said one end of said outlet pipe, said hollow cup-like device having interior walls and exterior walls defining said cavity, said exterior walls of said hollow cup-like device having a second plurality of apertures therein, a portion of said portion of the length of said inlet pipe being disposed within said cavity of said hollow cup-like device.

4,222,525

ARRANGEMENT FOR SPRAYING LIQUID FROM A BOTTLE

Bodo Hildebrandt, Rhönring, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,941

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728683

Int. Cl.² B05B 7/32

U.S. Cl. 239—343 **26 Claims**

25. A hand-held system for spraying a variety of liquids, which system is designed to prevent contamination of any liquid being sprayed by residue remaining from a liquid which has previously been sprayed, comprising:

(a) a non-disposable element for delivery of compressed air, the non-disposable element including

(1) a housing so shaped as to be graspable by a human hand,

(2) an electric motor located within the housing,

(3) an electrical power source located within the housing,

(4) a switch located within the housing and being connected in series with the source and the motor whereby the motor is turned on when the switch is closed and turned off when the switch is opened,

(5) an air pump located within the housing and connected to the motor to deliver compressed air when the motor is turned on,

(6) an air coupling located on the housing for supplying compressed air outside the housing,

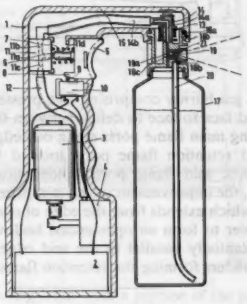
(7) a pressure relief valve located within the housing and having an intake passage, an outlet passage and a ventable relief passage which ventable relief passage can be opened and closed,

(8) a first air conduit located within the housing and connecting the air pump to the intake passage to enable compressed air to be delivered to the valve,

(9) a second air conduit located within the housing and connecting the outlet passage to the coupling to enable compressed air to be delivered to the coupling,

(10) controlling means located within the housing and movable back and forth to engage and disengage the ventable relief passage in a manner that the passage is closed when the controlling means is so engaged and in a manner that the passage is open when the controlling means is so disengaged,

(11) a manually operable trigger member located in the housing in a manner that it is manually operable by a user, the trigger member having a resting position and a



working position and cooperating with the controlling means and switch in a manner that the switch and relief passage are closed when the trigger is in the working position and the switch and passage are open when the trigger is in the rest position, and

(12) a first mounting half located on the housing adjacent the air coupling for detachably connecting a disposable element thereto; and

(b) a disposable element, the disposable element including

(1) a hollow, open-topped bottle with an interior in which liquid can be stored,

(2) an adaptor head located on top of the bottle, the adaptor head having a second mounting half cooperating with the first mounting half to detachably serve the adaptor to the housing, and further having a throughgoing intake passageway, the intake passageway being so located as to extend from the coupling into the interior of the bottle when the adaptor head is secured to the housing, whereby compressed air can be introduced into the interior of the bottle through the intake passageway when the adaptor head is secured to the housing, and still further having an outlet passageway,

(3) a hollow, open-ended, vertically elongated riser tube extending upwardly from the interior of the bottle to the adaptor head, the tube being fixed to the adaptor head in a manner that the tube communicates with the outlet passageway, whereby liquid stored in the bottle

can be forced into the riser tube and up into the outlet passageway when compressed air is introduced into the bottle, and

(4) an integral spray head located in the adaptor head, the spray head having a nozzle and a network of nozzle passages located within the spray head in a manner that the nozzle communicates with the intake passageway and the outlet passageway via the nozzle passages, whereby the nozzle can receive compressed air from the intake passageway and liquid from the outlet passageway.

4,222,526

GAS BURNER

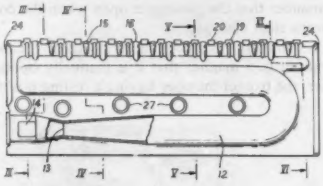
Christopher Halstead, London, England, assignor to Main Gas Appliances Limited, London, England

Filed Jan. 9, 1979, Ser. No. 2,133

Claims priority, application United Kingdom, Jan. 11, 1978, 1106/78

Int. Cl.[2] B05B *1/14*

U.S. Cl. 239—556 **4 Claims**



1. In a gas burner comprising two pressed sheet metal parts assembled face to face to define between them a gas manifold and having main flame ports along one edge of the assembled parts and retention flame ports located between said main flame ports, said flame ports communicating with the gas manifold, the improvement which comprises a plurality of tabs each of which extends from the edge of one of the parts and is curled over to form an open-ended hollow cylinder with its axis substantially parallel to the said edge, the open ends of these cylinders forming the retention flame ports.

4,222,527

CRYOPULVERIZING PACKED BED CONTROL SYSTEM

Robert B. Davis, Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 22, 1979, Ser. No. 14,105

Int. Cl.[3] B02C *13/288*

U.S. Cl. 241—33 **10 Claims**

1. A cryopulverizing packed bed system comprising: an insulated vertically oriented precooler into which is fed material to be pulverized and a cryogenic refrigerant in countercurrent directions, a comminuting mill, means for feeding said material from said precooler into said mill at a predetermined material feed rate; first valve means for controlling the supply of cryogenic refrigerant to said precooler, second valve means for supplying cryogenic refrigerant at a controlled rate to said mill and a control system for simultaneously adjusting said first and second valve means, said control system comprising:

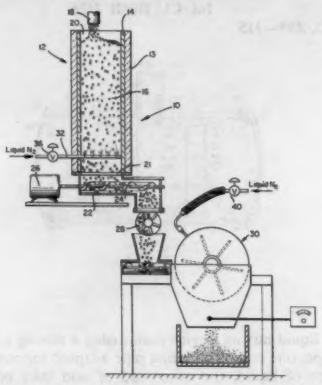
means for measuring the temperature of the material discharging from the mill;

means responsive to the discharge temperature in said mill for generating an output signal when the discharge temperature exceeds a predetermined level, with the magnitude of said output signal being proportional to the magnitude of the discharge temperature;

means for adjusting the opening of said second valve means in proportion to said output signal;

means responsive to said output signal for generating a first control signal which varies linearly over a predetermined signal range corresponding to the variation in said output signal and in a time period proportional to the residence time t_r of said feed material in said precooler;

means for generating a second control signal corresponding to said predetermined material feed rate;



means for deriving a third control signal proportional to the product of said first and second control signals respectively; and

means for operating said first valve means in response to said third control signal.

4,222,528

MILL

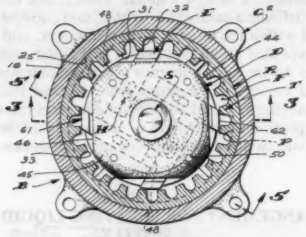
Arthur Smith, 1845 Randolph St., Los Angeles, Calif. 90001

Continuation-in-part of Ser. No. 806,724, Jun. 15, 1977, Pat. No. 4,141,510. This application Dec. 13, 1978, Ser. No. 968,740

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.[3] B02C *13/28*

U.S. Cl. 241—46.02 **16 Claims**



1. A mill comprising an elongate case with front and rear ends and a central longitudinal flow passage, coupling means coupling the front and rear ends of the case with upstream and downstream fluid conducting means, an elongate annular milling ring with front and rear ends arranged within the case between the ends thereof concentric with the flow passage therein and having a plurality of elongate axially extending circumferentially spaced inwardly projecting teeth projecting radially inward into the passage, adjacent teeth on the ring defining axially extending radially inwardly and axially opening material conducting passages, an elongate substantially disc-shaped rotor less in axial extent than the ring arranged concentric within the rear portion of the ring in free running clearance therewith, said rotor has a plurality of circumferentially spaced, elongate, straight guideways the axes of which occur on radial planes through the rotor, each guideway has an

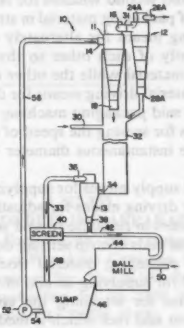
outer end opening substantially radially at the perimeter of the rotor, a plurality of milling blocks with elongate shanks having inner and outer ends and outer work-engaging heads on the outer ends of the shanks, the shank of each block is slidably engaged in a guideway with its head outside the guideways and projecting substantially radially outwardly from the rotor toward said ring, said heads have radially outwardly disposed end faces corresponding substantially in axial extent with said teeth and have substantially axially extending circumferentially disposed opposite sides converging with said faces and defining circumferentially spaced substantially axially extending cutting edges, stop means carried by the rotor and engaging the shanks of the blocks and limiting radial outward shifting of the blocks to positions where the outer faces and cutting edges are in close running clearance with the teeth and permitting free inward shifting of the blocks relative to the teeth, a shaft extending axially and concentric within the passage and drivingly supporting the rotor within the case and the ring, and a prime mover at the exterior of the case coupled with the shaft.

4,222,529

CYCLONE SEPARATOR APPARATUS

Edward W. Long, 5017 Shady Lake La., Lakeland, Fla. 33803

Filed Oct. 10, 1978, Ser. No. 950,063
Int. Cl.[2] B07B *7/00*
U.S. Cl. 241—77 **11 Claims**



1. An apparatus for separating a material into a fine component and a coarse component, comprising in combination:

a primary cyclone separator having a primary input, a primary fine component output and a primary coarse component output;

a primary pump connected to said primary cyclone separator for injecting the material into said primary input with the fine component of the material emanating from said primary fine component output and with the coarse component of the material emanating from said primary coarse component output;

a secondary cyclone separator having a secondary input, a secondary fine component output and a secondary coarse component output;

first connector means for directly connecting said primary fine component output to said secondary input for producing additional fine component of the material from said secondary fine component output and for producing additional coarse component of the material from said secondary coarse component output from the pressure of said primary fine component output;

second connector means for interconnecting said primary and secondary coarse component outputs;

a third cyclone separator having a third input, a third fine component output and a third coarse component output;

said second connector means interconnecting said primary and secondary coarse component output to said third input;

said third coarse component output being connected to a mill for reducing the size of the material emanating from said third coarse component output and discharging the mill output into a sump;

screen means for separating the output from said third fine component output;

means for directing material trapped by said screen means to said mill; and

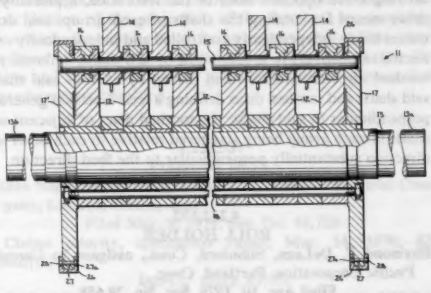
means for directing the material passing through said screen means to said sump.

4,222,530

REPLACEABLE PROTECTIVE MEANS FOR END DISC OF SHREDDER

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Filed Feb. 28, 1979, Ser. No. 16,026
Int. Cl.[3] B02C *13/28*
U.S. Cl. 241—194 **5 Claims**



1. A kit for protecting from wear a portion of the periphery of a circular end disc of a rotary hammer assembly of a shredder includes:

(a) a protective cap of hardened, wear resistant steel, said cap having a U-shaped channel for receiving a portion of the periphery of a circular end disc of a shredder, said channel having opposed walls each having at least two openings extending therethrough, the openings in each of the walls being aligned with respective openings in the opposed wall;

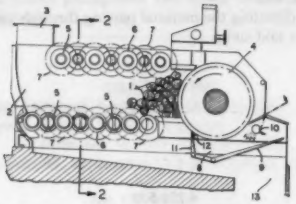
(b) at least two elongated pins of weldable steel, each of said pins having an enlarged head at one end, said pins being of sufficient length to extend through an opening in one wall of the channel of the cap, an aligned opening in an end disc, which opening has a diameter slightly larger than the diameter of the main body of the pin but smaller than the head, and into an aligned opening in the opposed wall of the cap; and

(c) at least two washers of weldable material, each washer having a pin-receiving opening, said washers being larger in diameter than the openings in the end disc and smaller than the openings in the cap so that when the pins are positioned in aligned openings in the cap and end disc and the washers are positioned about the other ends of the pins, the washers are in the openings in the caps and can be welded to the pins to retain the cap in position on the disc without the need for directly welding the pin to either the cap or the end disc.

4,222,531
WOOD PULPER WITH CONSTANT WOOD FEED

Helmut Thumm, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 7,953
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1978, 2804334
Int. Cl.[3] B02C *18/22*
U.S. Cl. 241—281 8 Claims

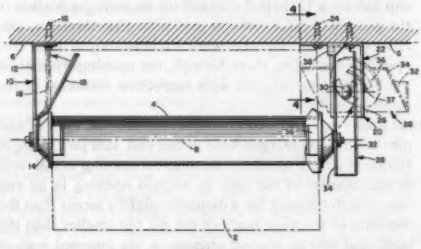


1. A wood pulper comprising: a pulp trough, a grinding element positioned over said pulp trough, a feed zone in front of said grinding element, a plurality of substantially parallel shafts mounted in said feed zone, said shafts being arranged in at least two sets which are spaced from each other and located on respective opposite sides of the feed zone, a plurality of drive means for rotating the shafts of each group, said drive means being independently controlled and independently connected respectively to at least some of said shafts, a plurality of toothed discs mounted on and driven by each of said shafts, said shafts and toothed discs defining a feed direction generally perpendicular to said shafts, the toothed discs of adjacent said shafts in each group being staggered relative to each other in a direction substantially perpendicular to the feed direction.

4,222,532
ROLL HOLDER

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 10, 1979, Ser. No. 28,658
Int. Cl.[2] B65H *19/00*
U.S. Cl. 242—55.2 15 Claims



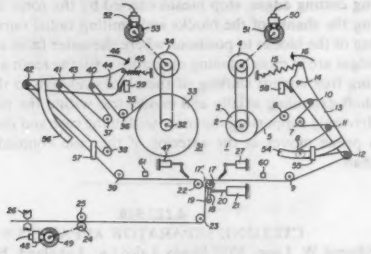
1. In a holder for supporting a roll of wound material for rotation about its wound axis including a pair of spaced roll supporting means flanking the roll on opposite ends thereof, one of said roll supporting means comprising a movable arm pivotable between a roll supporting position adjacent one end of the roll and a roll loading position spaced therefrom, the improvement comprising:

said movable arm is pivoted for movement about an axis oblique to said wound axis between said roll supporting positon and a roll loading position spaced axially and transversely from said roll supporting position.

4,222,533
PACKAGING MATERIAL FEEDING DEVICE FOR A PACKAGING MACHINE

Endre Pongracz, Ecublens, Switzerland, assignor to Societe Anonyme des Plieuses Automatiques (SAPAL), Switzerland

Filed Aug. 29, 1979, Ser. No. 70,681
Claims priority, application Switzerland, Sep. 5, 1978, 9298/78
Int. Cl.[3] B65H *19/14*
U.S. Cl. 242—58.3 10 Claims



1. A device for feeding package material to a packaging machine comprising:

at least first and second winders for receiving first and second reels of packaging material in strip form, respectively;

winder driving means for alternately driving said winders independently of each other so that one reel is feeding packaging material while the other reel can be reloaded;

packaging material driving means for driving the packaging material to said packaging machine;

sensing means for sensing the speed of said packaging material and the instantaneous diameter of said real which is feeding;

control signal supply means for supplying a control signal to said winder driving means for adjusting the driving speed of said winders in response to said sensing means;

first and second ends of strip sensing devices for sensing the end of the packaging material from said reel which is feeding and for supplying an end of strip control signal;

attaching means for attaching the end of the packaging material from said reel which is feeding to the beginning of the packaging material from said other reel; and

actuating means for actuating said attaching means in response to said end of strip control signal.

4,222,534
FISHING REEL

Takuo Ishida, Sennan, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Jan. 29, 1979, Ser. No. 7,178
Claims priority, application Japan, Feb. 4, 1978, 53-13048
Int. Cl.[3] A01K *89/01*
U.S. Cl. 242—84.2 R 3 Claims

1. A fishing reel comprising:

a reel body;

a tubular shaft rotatably supported at the front of said reel body;

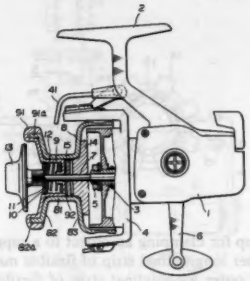
a rotary frame having a bail arm and being fixed to said tubular shaft;

a spool shaft supported to said tubular shaft and extending forwardly of said reel body;

a spool which serves to wind a fishing line thereon and is immovably supported to said spool shaft, said spool having a trunk and a pair of first and second round flanges, said first flange being positioned at a side of which the fishing line is drawn out of said spool and being smaller in diameter than said second flange positioned at a side of said reel body, said first flange being provided at the outer

circumferential edge with an annular forwardly projecting edge;

a sliding cylinder slidably supported to said trunk of said spool, said sliding cylinder having a fishing line guide slidable in close contact with the outer periphery of said projecting annular edge;



a fixing member fixed to the fore end of said spool shaft; and

a spring inserted between said fixing member and said sliding cylinder so as to urge said sliding cylinder toward said reel body.

4,222,535

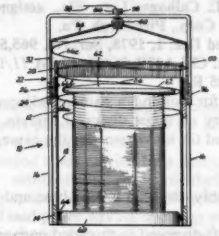
WIRE DEREELING APPARATUS

Hugh W. Hosbein, Fort Wayne, Ind., assignor to Mossberg Hubbard, Division of Wanskuck Company, Garrett, Ind.

Continuation-in-part of Ser. No. 38,087, May 11, 1979, abandoned. This application Jul. 16, 1979, Ser. No. 58,015

Int. Cl.³ B65H *49/00*

U.S. Cl. 242—128 **11 Claims**



1. Dereeling apparatus for unreeling wire from a spool disposed with the axis thereof upright comprising a first cylindrical shroud adapted to be positioned coaxially over said spool in radially spaced relation therewith and with the upper end disposed above said spool, a ring of multiple circumferentially spaced projections on the upper end portion of said first shroud, a second cylindrical shroud of larger diameter than the first and coaxially disposed to overlie said ring in radially spaced relation, and means disposed centrally of said shrouds axially above said ring for receiving a strand of wire being unreeled from said spool.

4,222,536

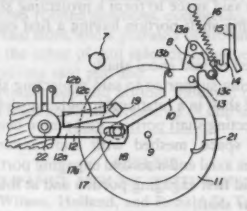
DEVICE FOR SENSING AND INDICATING THE END OF A TAPE IN A TAPE RECORDER

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1978, Ser. No. 943,614

Int. Cl.³ G03B *1/04;* G11B *15/32, 23/04*

U.S. Cl. 242—191 **8 Claims**



1. A device for sensing the end of a tape in a tape recorder having a tape supply shaft comprising: a rotatable tape end sensing lever connected to the tape supply shaft at one end and having an operational swtich at the other end, a flywheel having an annular projection touchable by the operational switch when the sensing lever is rotated, said annular projection forming a recess with a predetermined inclined angle at an inner portion of the projection of the flywheel for receiving the switch, the sensing lever being constructed so that when the lever is rotated, the operation switch is moved into the recess and an end sensing and indicating signal is generated at a predetermined position.

4,222,537

FISHING REEL

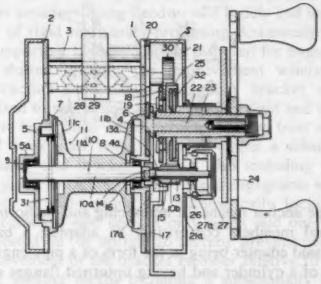
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 8, 1979, Ser. No. 18,728

Claims priority, application Japan, Mar. 14, 1978, 53-33065[U]

Int. Cl.³ A01K *89/00*

U.S. Cl. 242—212 **4 Claims**



1. A fishing reel comprising;

(a) first and second side plates opposite to each other, said side plates being connected at a regular interval by a plurality of connecting rods, said first side plate having a first bearing, said second side plate having a second bearing;

(b) a gear cover fixed outwardly from said first side plate, said gear cover and first side plate enclosing a space therebetween;

(c) a handle shaft rotatably supported between said first side plate and said gear cover, said handle shaft projecting

outwardly from said gear cover to form a projecting shaft portion, said projecting shaft portion carrying a handle bar;

(d) a master gear carried by said handle shaft, said master gear being disposed within said space;

(e) a spool shaft positioned between said first and second bearings and journaled therewith, said spool shaft projecting axially outwardly from said first bearing and penetrating through said space to form a projecting shaft portion, said projecting shaft portion having a first engaging portion;

(f) a spool fixed to said spool shaft;

(g) a pinion being supported to said projecting shaft portion at said spool shaft in a relationship of being slidable axially of said projecting shaft portion, said pinion being disposed within said space, meshed with said master gear, and having at one axial end a second engaging portion engageable with said first engaging portion and at the other axial end a tubular shaft;

(h) control means for controlling said pinion in sliding motion;

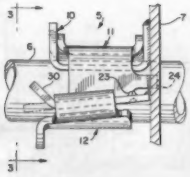
(i) support means being provided at said gear cover and having a supporting portion for supporting said tubular shaft, said supporting portion of said support means and said tubular shaft having a gap therebetween, said gap allowing said pinion including said tubular shaft to rotate and axially slide, said support means being adapted to bear said tubular shaft when deflection is produced at said projecting shaft portion of said spool shaft.

4,222,538

PIPE ANCHOR

Finn Jensen, Dolton, Ill., and Theodore J. Sweger, Lake Worth, Fla., assignors to Illinois Railway Equipment Company, Chicago, Ill.

Filed Jan. 19, 1979, Ser. No. 4,694
Int. Cl.[2] F16L *5/00, 3/08*
U.S. Cl. 248—56 **7 Claims**



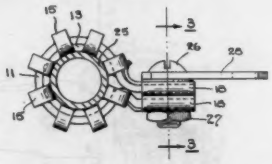
1. Pipe anchor means for embracing and anchoring pipes to structural members comprising: an adapter; a base; and a clamp; said adapter being in the form of a pipe-engaging axial section of a cylinder and having upturned flanges at opposite ends thereof; said base being in the form of a saddle having a seat portion fitting on said adapter, upturned ends of said saddle engaging said upturned flanges of said adapter, and depending pipe-embracing side portions having out-turned inclined longitudinal flanges; and, said clamp being in the form of a pipe-engaging cradle portion having a pair of inclined inwardly opening channel formations adapted to slidably receive therein said out-turned inclined longitudinal flanges and by cam action draw said depending pipe-embracing side portions of said base and said pipe-engaging axial section of said adapter and said cradle portion of said clamp into generally equi-spaced four-point embracing support of said pipe.

4,222,539

CLAMP FOR CLAMPING TUBING, WIRE BUNDLES, OR THE LIKE

Jack M. Kramer, 1942 Corning St., Los Angeles, Calif. 90034

Filed Oct. 30, 1978, Ser. No. 955,582
Int. Cl.[2] F16L *3/12*
U.S. Cl. 248—74 B **9 Claims**



1. A clamp for clamping an object to a support comprising:

a first inner longitudinal strip of flexible material,

a second outer longitudinal strip of flexible material, said second strip overlying the first strip and having end portions at both ends thereof which extend beyond the ends of said first strip,

hinge means of flexible material for joining the side edges of said first strip to the side edges of said second strip, said hinge means being fixedly attached at the opposite ends thereof to each of said side edges,

clamping tabs attached to the end portions of said second strip,

means for drawing said clamping tabs towards each other when the clamp is wrapped around said object with the inner surface of said first strip in abutment against the outer surface of the object and the outer surface of the first strip in sliding contact with the inner surface of the second strip, and

means for attaching the clamp to a support,

whereby the inner strip is tightly secured to the object and relative sliding movement is permitted between the inner and outer strips along the interfaces therebetween to accommodate movement of said object relative to said support.

4,222,540

TUBE SHEET PAN AND TILT CAMERA PLATFORM

William E. King, McCandless Township, Allegheny County, Pa., and Gregory L. Calhoun, Lutz, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 1, 1978, Ser. No. 965,557
Int. Cl.[2] A47B *96/06;* **F16M** *11/02*
U.S. Cl. 248—205 R **8 Claims**

1. Apparatus for holding a camera adjacent a tube sheet having a plurality of tubes disposed therein, said apparatus providing pan and tilt movement for the camera and comprising:

a base,

a sleeve rotatably disposed in said base and having internal threads,

a threaded shaft disposed in threaded engagement with said sleeve,

means for rotating said sleeve to move said base up and down said shaft,

a bracket disposed on said base,

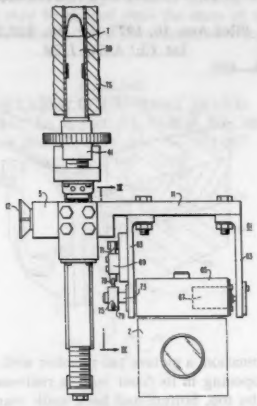
a camera platform pivotally disposed on said bracket,

means for pivoting said platform with respect to said bracket,

a pin disposed on one end of said shaft, insertable in a tube and having means incorporated therein for expandingly engaging said tube,

a nut disposed on said threaded shaft and cooperatively associated with said pin so that when rotated in one direction, it will expand said pin into engagement with said tube

and when rotated in the opposite direction will cause said pin to disengage said tube, and



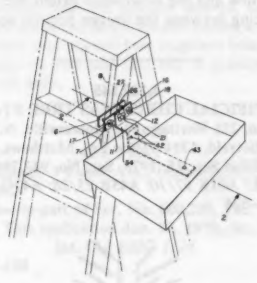
means for rotating said nut and for rotating said platform whereby a camera disposed on said camera platform may pan the tube sheet.

4,222,541

LADDER TRAY SUPPORT ATTACHMENT

Daniel J. Cillis, 17225 Robey Dr., Castro Valley, Calif. 94546

Filed Dec. 14, 1978, Ser. No. 969,354
Int. Cl.[2] E06C *7/14*
U.S. Cl. 248—210 **1 Claim**



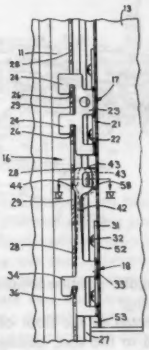
1. A demountable ladder tray support comprising:
a pair of support plates dimensioned for clamping on opposite sides of a ladder side rail;
a pair of threaded studs carried by a first of said plates and projecting substantially perpendicularly thereto, said studs being spaced apart to straddle said side rail;
the second of said plates having openings positioned for and slidably receiving said studs with the latter projecting therethrough to an exterior side of said second plate;
helical springs on said pair of studs mounted between and in compression engagement with said plates;
manually engageable nuts threaded on said stud ends for clamping said plates together on said side rail;
a third stud carried by said second plate and projecting substantially perpendicularly from said exterior side thereof;
a tray support bracket comprising a rigid elongated strip having a normally upright end providing said bracket side, a contiguous normally lateral portion for spacing a bracket supported tray from said side rail, a third normally upright portion depending from said second portion, and a fourth portion contiguous to and extending laterally from said third portion, said bracket side having an opening for and receiving said third stud and providing a pivotal connection for relative rotational displacement of said bracket;
manually engageable means on said third stud retaining said pivotal connection;
index means mounted on said second plate exterior side and said bracket side for locking said bracket and second plate in selected rotated positions, comprising a pin carried by one of said sides, and a plurality of arcuately spaced openings in the other of said sides dimensioned and positioned for receiving said pin; and
a tray having a side and bottom mounted on and supported by said third and fourth portions of said strip, respectively.

4,222,542

END PANEL MOUNT WITH SAFETY LOCK

Harold R. Wilson, Holland, and Ronald D. Ten Elshof, Grandville, both of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

Filed Nov. 27, 1978, Ser. No. 964,131
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—243 **9 Claims**



1. In combination, a bracket structure for lockingly supporting an article on a slotted upright in a cantilevered relationship, said bracket structure being fixed to said article and including a plurality of rigid rearwardly-projecting downwardly-opening load-supporting L-shaped hooks disposed for engagement with the slotted upright, the improvement wherein said bracket structure comprises a one-piece bracket member which is fixed to said article and includes a rigid and substantially planar hook plate which terminates in at least one said hook, said hook plate being disposed within a substantially vertical plane, said bracket member also including locking means integrally associated therewith and engageable with one of the slots of said upright for automatically locking said bracket member to said upright only when said one hook is properly seated on the upright to thereby prevent accidental upward movement of the bracket member relative to the upright, said locking means including a substantially straight elongate cantilevered spring arm which is integrally fixed at one end thereof to said bracket member, said spring arm extending substantially vertically in approximately parallel relationship to said slotted upright and having a rearwardly-projecting locking tab provided adjacent the free end thereof so that said locking tab is movably urged substantially perpendicularly toward said slotted upright due to the urging of said spring arm, said locking tab having an upwardly-facing stop surface adapted to be disposed directly below a downward-facing surface on said upright, said spring arm resiliently urging said locking tab rearwardly into one of said slots when said one hook is positioned and properly seated within its

respective slot, and said locking tab being vertically spaced a preselected distance from said one hook so that said locking tab is automatically resiliently inserted into its respective slot only when said one hook is fully seated within its slot, whereby said bracket member is mountable on said upright only by initially properly seating said one hook within its respective slot following which said locking tab is automatically moved into its respective slot to prevent upward movement of said bracket member.

4,222,543

VERTICAL AND ANGULAR ADJUSTMENT DEVICE FOR VEHICLE SEATS

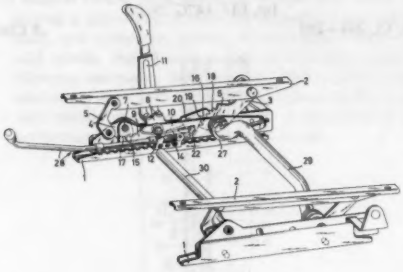
Alfred Gedig, and Burckhard Becker, both of Solingen, Fed. Rep. of Germany, assignors to Rob. Hammerstein GmbH, Solingen-Merscheid, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,879

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749716

Int. Cl.[2] B60N *1/02*

U.S. Cl. 248—394 **8 Claims**



1. A vertical and angular position adjusting device for use in vehicle seats, comprising:

a base frame connected to the floor of the vehicle; a seat carrier connected to the seat; linking means including a two-bar elbow joint hinged between first juxtaposed ends of said frame and said carrier and one bar hinged between second ends of said frame and said carrier to form therewith a five bar linkage; a first gear segment secured to said one bar; a first latch supported for tilting movement in the plane of said first gear segment and having at least one tooth engageable with the latter and a recessed face defining two switching portions; a second gear segment secured to a bar of said elbow joint; a second latch in the form of a two-arm lever supported for a combined tilting and linear movement in the plane of said second gear segment and having on one arm thereof provided with a locking tooth engageable with said second gear segment and the other arm thereof provided with a projecting cam engageable with one switching portion of said first latch corresponding to a locking position of said first latch with said first gear segment, and, alternately with the other switching portion corresponding to the releasing position of said first latch; means for guiding said second latch in a linear direction between a locking position in which said locking tooth is in engagement with said second gear segment and a releasing position away from said second gear segment; spring means normally biasing said second latch into said locking position; a hand-operated lever coupled to said second latch to rotate the same between a first end position in which said cam engages said one switching face portion and an opposite second end position in which said cam engages said other switching face portion and to displace said second latch in said guiding means against said biasing spring.

4,222,544

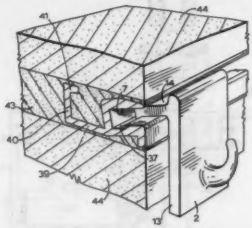
PICTURE RAIL APPARATUS

Kenneth Crowder, 2344 S. Sheridan Way, Mississauga, Ontario, Canada

Filed Aug. 10, 1977, Ser. No. 823,220

Int. Cl.[3] A47G *1/24*

U.S. Cl. 248—495 **5 Claims**



1. In combination, a picture rail member with a horizontally continuous opening in its front wall, a rearwardly elongated slot defined by top, bottom and back walls rearwardly of the opening, a horizontally continuous recess in the bottom wall of the slot adjacent its back wall, said recess extending forwardly and downwardly in undercut relationship beneath the back edge of said bottom wall, and a hook member comprising a rearwardly elongated tongue engaging slidably on said bottom wall and having its top surface spaced from said top wall, a front plate portion having hook means thereon and a rear face spaced from the front wall of the rail member, and a dovetail portion adjacent the rear edge of said tongue portion with a projection forwardly and downwardly in snug engagement within said undercut recess, the forward extent of said projection being less than the spacing between the rail member and the plate portion and the downward extent thereof being less than the spacing between the tongue portion and the slot top wall.

4,222,545

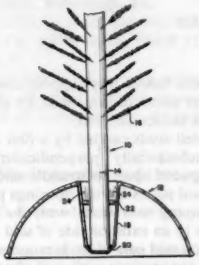
ARTIFICIAL CHRISTMAS TREE STAND

Roy D. Patton, 221 Heritage Pl., Mooresville, N.C. 28115, and Frank P. Rietveld, 1314 Vickie La., Matthews, N.C. 28105

Filed Sep. 15, 1978, Ser. No. 942,796

Int. Cl.[2] A01K *97/10;* A45B *25/28;* A47G *25/12*

U.S. Cl. 248—524 **6 Claims**



1. A stand for an artificial Christmas tree and the like comprising:

a base;

a downwardly tapered opening formed in said base;

a collar having its periphery downwardly tapered in a manner complementary with said opening, said collar having a plurality of spaced, downwardly disposed elongated openings formed in its upper edge and a plurality of upwardly disposed elongated openings formed in its lower

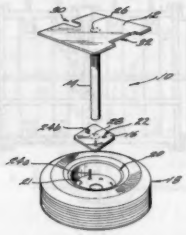
edge, said openings in the lower edge circumferentially displaced with respect to said openings in the upper edge, said collar further having a central opening formed in it whereby it may be slipped onto the stem of a tree to be mounted preliminary to its insertion in said base opening.

4,222,546

PORTABLE EQUIPMENT STAND

Sanders B. Walker, Jr., R.F.D. #1, McRae, Ga. 31055

Filed Dec. 19, 1978, Ser. No. 971,837
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—676 **12 Claims**



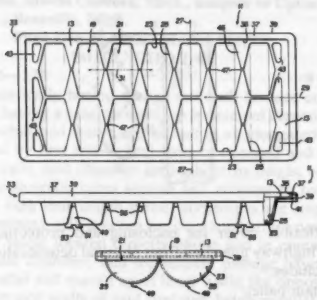
1. A portable reloading press stand comprising a top and base member respectively connected to the opposite ends of a support pipe, said base member having first means defining a single hole on one side of said support pipe and second means defining a pair of spaced apart holes on the opposite side of said support pipe said first and second means cooperating together for providing mounting holes for properly supporting said press, said top member having means defining first and second slots positioned on opposite sides of said top member and extending inwardly from the exterior thereof, said first slot having a curved interior, said second slot having a substantially rectangular shape, said top and base members being secured to said support pipe so that said first slot is positioned directly above said single hole.

4,222,547

ICE TRAY

Michael G. Lalonde, 3 Fuller Ave., Leamington, Ontario, Canada (N8H 3S2)

Continuation-in-part of Ser. No. 660,239, Feb. 23, 1976, abandoned. This application Jan. 12, 1979, Ser. No. 2,967
Int. Cl.[3] F25C *1/24*
U.S. Cl. 249—120 **24 Claims**



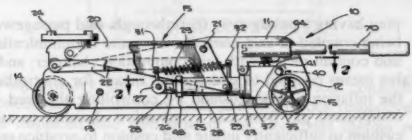
1. In an ice tray of resilient plastic, a plurality of spaced apart cavities, each said cavity being defined by several intersecting walls including a bottom wall presenting two spaced apart opposed end edges uppermost flanked by a pair of side walls, each said side wall being inclined upwardly and outwardly from the intersection with said bottom wall at an angle ranging between a lower value substantially greater than 90° exceeding a draft angle required for mould withdrawal up to about 105°, and presenting side edges uppermost which merge with said spaced, opposed end edges of said bottom wall to define the perimeter of the cavity opening, a wall formation extending between said cavities in the region of their uppermost edges to integrally interconnect and support same in spaced apart tray defining relation, said cavity walls and uppermost wall formation having a substantially constant thickness throughout their extent and of a stiffness and resiliency to substantially maintain cavity shaping under freezing and thawing conditions, the internal configuration of each said cavity walls having a common axis of revolution uppermost and an angular extent with reference to said axis of revolution not exceeding 180°.

4,222,548

UNITARY OIL BLOCK

Julius F. John, Gardena, Calif., assignor to Norco Industries, Inc., Gardena, Calif.

Filed May 2, 1979, Ser. No. 35,213
Int. Cl.[3] B66F *5/04*
U.S. Cl. 254—8 B **6 Claims**



1. A unitary multiple purpose oil block for mounting between a pair of side plates of a lifting jack frame and for support thereon of a hydraulic power cylinder for the lifting jack, said block comprising side faces, forward and aft end faces, a top face and a bottom face, means forming an oil reservoir in said block intermediate said side faces and a partition with a connecting passageway therethrough located intermediate said side faces dividing said reservoir into opposite chambers, a first hole in said forward end face for reception of said cylinder, a second hole located in a second of said faces and in alignment with said partition and having a reciprocating pump piston therein, a sealing bushing around the piston closing the outside end of said second hole, handle means, and a pivot connection between said handle means and said block in alignment with said partition pivotally mounting the handle means on the block in operating relationship with the piston, a third hole located in a third of said faces in alignment with said partition and having a rotatably adjustable lift-lower valve element therein, a sealing bushing around the lift-lower valve element, and a fourth hole located in the second of said faces in alignment with said partition and having an overload release valve member therein, an adjustable plug rotatably mounted in said fourth hole and hydraulic passageways in said partition extending inwardly from said respective holes, said passageways being adapted to interconnect the reservoir with said holes, said passageways being in mutual right angular relationship.

4,222,549

APPARATUS FOR BREAKING WOOD

Mats Lindgren, Vikmanshyttan, Sweden, assignor to Nordfor AB, Säter, Sweden

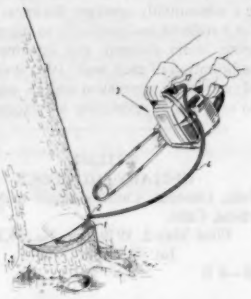
Continuation-in-part of Ser. No. 720,604, Sep. 7, 1976, Pat. No. 4,172,479. This application Jul. 6, 1978, Ser. No. 922,278
Claims priority, application Sweden, Apr. 14, 1976, 7604423
Int. Cl.[3] B66F *33/24*; F02M *57/06*
U.S. Cl. 254—93 HP **11 Claims**

1. Apparatus for producing a breaking force against a cutting surface in a notch, or the like, in wood, comprising:

an inflatable cushion insertable in said notch for applying a breaking force to at least one cutting surface in said wood upon inflation of said cushion;

conduit means for connecting said cushion to the combustion chamber of a cylinder of an internal combustion engine;

a spark plug connected to said combustion chamber of the cylinder of said internal combustion engine, said spark



plug having a passageway therethrough, said passageway being coupled to said conduit means and communicating said conduit means with said combustion chamber; and

valve means coupled to said conduit means for controlling the inflation of said cushion by controlling the feed of compressed gas from said combustion chamber to said cushion to sufficiently inflate said cushion to produce said breaking force.

4,222,550

MOBILE WINCH

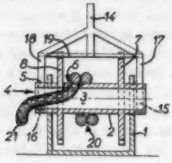
Pierre de Bosredon, 17 rue Millet, 24 Bergerac, France

Filed Aug. 2, 1977, Ser. No. 821,149

Claims priority, application France, Aug. 3, 1976, 76 23773

Int. Cl.[2] A63B *61/04*

U.S. Cl. 254—223 **5 Claims**



1. A mobile winch for the lashing of loads with a rope or cable, comprising a base, a drum in the form of an open-ended tube rotatably mounted on the base, and means for rotating the drum relative to the base, the drum being provided with a first opening in the peripheral surface of the drum slightly larger in diameter than the lashing rope or cable and communicating with an axial second opening in one end of the drum larger in diameter than the lashing rope or cable, said drum carrying at least one coaxial ratchet wheel cooperating with a detent pawl on the base, said base being formed with a bar extending parallel to the drum axis for attachment of a cable or rope to connect the winch to a fixed support, said base being of channel-shaped construction with the drum extending across the channel and rotatably supported at each end in a respective side at the channel, whereby the free end of a lashing cable or rope can be freely passed respectively through said first and second openings and outside the base so that the free hanging end of the cable or rope can be gripped and pulled to pretension the lashing cable or rope into gripping engagement with the edge of the first opening before the drum is rotated for final tightening.

4,222,551

PULLEY-BLOCK WEIGHING-BALANCE

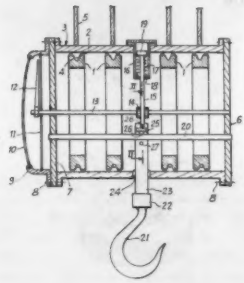
Francois Simon, Route d'Annecy, 73410 Albens, France

Filed Sep. 29, 1978, Ser. No. 947,031

Claims priority, application France, Oct. 4, 1977, 77 29834

Int. Cl.[3] B66D *1/00, 1/48*

U.S. Cl. 177—132 **12 Claims**



1. A pulley-block balance comprising at least one loose pulley over which the lifting cable runs, a coaxial support of hollow construction on which the pulley is supported by ball-bearing means, a hook or the like for receiving a load, and coupling means between said hook and said support, wherein said coupling means comprise a movable member which is capable of undergoing displacement at least at the point of application of the force arising from the load, said movable member being located within the internal space which is common to the support and to the pulley and being subjected to a restoring action in the direction opposite to said force and adapted to control load-indicating means as a result of its displacement under the action of said force.

4,222,552

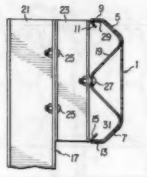
HIGHWAY GUARDRAIL COVER

George W. Matteo, Sr., 1405 Chews Landing Rd., Laurel Springs, N.J. 08021

Continuation-in-part of Ser. No. 817,842, Jul. 21, 1977. This application Oct. 20, 1978, Ser. No. 952,966

Int. Cl.[2] E01F *15/00*

U.S. Cl. 256—13.1 **19 Claims**



1. A flexible cover for enclosing and protecting a rigid elongate highway guardrail from physical deterioration, which cover includes:

(a) a main panel;

(b) a pair of corner panels diverging outwardly from opposed portions of the main panel and defining obtuse angles therewith;

(c) an edge panel carried by each corner panel; and

(d) an inwardly directed flange carried by each edge panel and defining an acute angle therewith for snap-fit attach-

ment around a corresponding rigid portion of the guard-rail.

4,222,553

SLIDING NOZZLE APPARATUS FOR BLOWING POWDERY TREATING AGENT

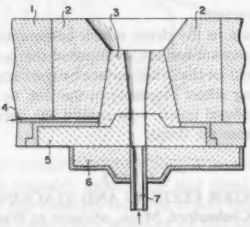
Yoshito Edamoto, No. 3515 Totsukacho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Oct. 25, 1978, Ser. No. 954,436

Claims priority, application Japan, Aug. 23, 1978, 53-114617[U]

Int. Cl.[2] C21C 5/48

U.S. Cl. 266—47 **3 Claims**



1. An apparatus for blowing a powdery treating agent into a vessel containing molten metal comprising: a gas permeable ceramic nozzle having a passageway therethrough which communicates with the interior of said vessel; a means for causing gas to impinge on said gas permeable nozzle whereby a gas film can be formed on the surface of said nozzle to prevent molten metal and molten treating agents from becoming bonded thereto; a bottom plate member for supporting said ceramic nozzle, said bottom plate member having a passageway therethrough communicating with the passageway through said ceramic nozzle; and a slideable plate member in contact with said bottom plate member, said slideable plate member being moveable between a first open position and a second closed position and having a tuyere therein for communicating with said opening in said bottom plate member when said slideable plate is in the open position whereby the flow of gas into said molten metal can be terminated by moving said slideable plate member to the closed position thereby removing the necessity of continuously blowing gas through said tuyere to prevent it from becoming blocked.

4,222,554

ELECTRIC SALT BATH FURNACE

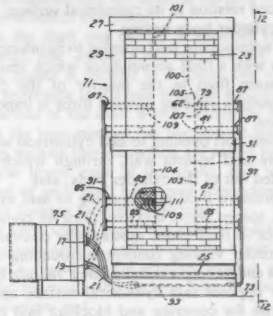
Leslie Bassett, Mount Clemens, Mich., assignor to Upton Industries, Inc., Roseville, Mich.

Filed Dec. 6, 1978, Ser. No. 966,926

Int. Cl.[3] C21D 1/46

U.S. Cl. 266—120 **9 Claims**

1. An electrically heated molten salt bath furnace comprising a frame having a base; an open top housing of ceramic brick enclosed within said frame and including an elongated chamber enclosed by first and second pairs of opposed and spaced apart side walls; said chamber throughout its height being of generally rectangular cross section and adapted to receive a molten salt bath into which metal workpieces are suspended for heat treatment; said housing having a top entrant passage of rectangular shape located directly above and in communication with said chamber, said top entrant passage having two pairs of parallel and spaced apart inner walls; the opposed and spaced apart side walls of said first pair being parallel to one another throughout their vertical extent from the top to the bottom of said chamber and extending in a first direction; the opposed and spaced apart side walls of said second pair extending in a second direction which is perpendicular to said first direction; at least one of the opposed and spaced apart side walls of said second pair being displaced outwardly of said entrant passage; a plurality of vertically spaced tiers of vertically spaced electrodes arranged in each side wall of said second pair along the height of said chamber intermediate its ends; said electrodes being laid in recesses extending in said second direction along the spaced apart side walls of said second pair; said electrodes each exposing only one face to the bath in said chamber and being located below the level of the molten salt bath for the passage of current through the bath between the electrodes of each tier for maintaining the bath at a predetermined heat treat temperature; transformer means



having primary and secondary pads; electrical connectors between said transformer pads and electrodes respectively; said displaced side wall spacing the electrodes therein outwardly of said entrant passage, whereby the workpieces to be treated extend through said entrant passage and chamber to the bottom of said chamber, said tiers of electrodes maintaining a substantially uniform temperature gradient of said bath throughout the height of said chamber; said entrant passage spacing the workpieces inwardly of the electrodes in said displaced side wall of said second pair, so as not to obstruct current flow between the electrodes in each tier.

4,222,555

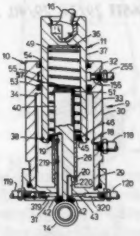
HYDRAULIC CUSHIONING DEVICE FOR VEHICLE SEAT

Shawn H. Eimen, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jan. 26, 1979, Ser. No. 6,584

Int. Cl.[2] A47C 7/14; F16F 9/16

U.S. Cl. 267—131 **5 Claims**



1. A device for connection between a vehicle chassis member and a seating member to provide for support of the seating member in a manner to cushion relative upward and downward motion between said members, said device being of the type comprising a cylinder body for connection to one of said members and a piston for connection to the other of said members, said piston being coaxially slideable in the cylinder body

upwardly and downwardly from a normal position, said device being characterized by:

A. said cylinder body comprising
(1) a bottom wall,
(2) an annular side wall which projects up from said bottom wall, and
(3) a concentric post-like portion projecting up from said bottom wall and having a cylindrical surface;

B. the piston comprising
(1) a top wall and
(2) an annular side wall which has slideable sealing engagement with the side wall of the cylinder body and which surrounds said post-like portion in radially spaced relation to its cylindrical surface;

C. said cylinder body having
(1) an accumulator port opening to its interior, for connection with a fluid accumulator which tends to maintain pressure fluid in the interior of the cylinder body whereby a yielding upward force is imposed upon the piston,
(2) a vent port opening to said cylindrical surface, spaced above said bottom wall, through which fluid can be vented out of the cylinder body, and
(3) a pressure fluid port opening to said cylindrical surface, spaced above said vent port, for connection with a source of fluid under substantially constant pressure;

D. an annular valving element surrounding said post-like portion and having a radially inner valving surface which closely opposes said cylindrical surface and cooperates therewith for covering and blocking said pressure fluid port and said vent port, said valving element being of such axial extent that both of those ports are blocked by it only when the valving element is in a normal position from which it can move up and down; and

E. motion transmitting means providing a connection between the piston and the valving element that permits relative axial motion between them but whereby movement of the piston in each direction from its normal position compels movement of the valving element in the same direction out of its normal position, said motion transmitting means comprising a spring connected between the piston and the valving element.

4,222,556

SHEET FEEDING APPARATUS UTILIZING A SPIRALLY SLOTTED STACKING WHEEL

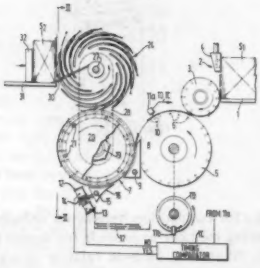
Christopher P. Chapman, Hayling Island, and David G. Boulter, Clanfield, both of England, assignors to De La Rue Systems Limited, London, England

Filed Oct. 17, 1978, Ser. No. 952,182

Claims priority, application United Kingdom, Oct. 19, 1977, 43531/77

Int. Cl.[2] **B65H** *29/24, 29/40, 31/06, 1/02*

U.S. Cl. 271—3.1 **14 Claims**



1. Apparatus for stacking flexible sheets, comprising:

a rotatable stacking wheel having slots presenting sheet-receiving openings substantially tangential to the wheel periphery and defining spiral paths for sheets fed into the slots as the wheel rotates;

a stack support means arranged for removing the sheets from the slots of the wheel and forming a stack therefrom;

a driven vacuum transportation drum for conveying the sheets from a flow path along an arcuate path to the stacking wheel, the drum being mounted for rotation about an axis parallel to the axis of the stacking wheel and having an annular circumferential slot, the stacking wheel being spaced from the drum by a distance such that the extremity of the stacking wheel enters the said slot and being driven at a lower peripheral speed than the drum and in a direction of rotation opposite to that of the drum and such that the slots of the stacking wheel trail in the direction of rotation;

a source of vacuum;

and port means in the drum which communicate with the source of vacuum and are so disposed that a sheet continues to be held on the drum surface by the vacuum until the said stacking wheel extremity in the slot, by virtue of its lower peripheral speed, acts against the vacuum to strip the sheet from the drum.

4,222,557

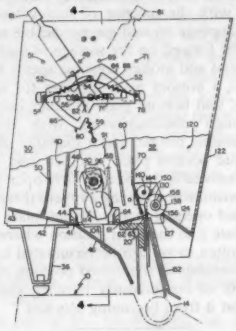
PRINTER FEEDING AND STACKING

Edward S. Wu, Chelmsford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed May 16, 1978, Ser. No. 906,581

Int. Cl.[3] **B65H** *3/44, 1/12, 1/28, 3/06*

U.S. Cl. 271—4 **17 Claims**



1. A dual sheet feeder for a printer or the like, comprising

a supporting frame

a pair of opposed sheet hoppers mounted on said frame for supporting opposed stacks of paper sheets and

extracting means mounted on said frame between said hoppers for selectively extracting sheets from either of said hoppers, said extracting means having

a drive shaft mounted on said frame between said hoppers for rotation about an axis parallel to said hoppers

reversible power means for selectively rotating said drive shaft in opposite directions

rocker arm means rockably mounted on said drive shaft

sheet engaging roll means rotatably mounted on said rocker arm means for rotation about an axis spaced from and parallel to the axis of said drive shaft

sheet engaging roll driving means mounted on said drive shaft for rotating said sheet engaging roll and

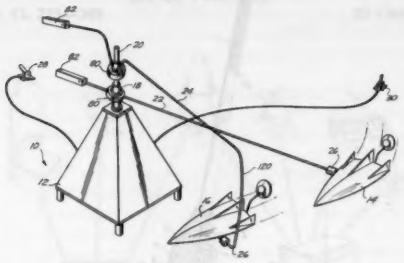
friction means interposed between said arm and said drive shaft for rocking said arm in the direction of rotation of said drive shaft to selectively engage said sheet engaging roll means responsive to the direction of rotation of said drive shaft with one of said opposed stacks of paper sheets and extract an individual sheet therefrom.

4,222,558

FLIGHT VEHICLE TOY

James Tinguely, New York, and Edward Snyder, III, Dix Hills, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Mar. 2, 1979, Ser. No. 16,849
Int. Cl.³ A63H *27/04*
U.S. Cl. 272—31 A **22 Claims**



1. A flight vehicle toy comprising a support stand, a first hollow shaft rotatably mounted in said stand; a second shaft coaxial with and rotatably received in said first shaft; a pair of support arms respectively mounted on said shafts for rotation therewith and extending from said shafts to free ends; a pair of flight vehicles; cooperating means on said arms and vehicles for releasably mounting said vehicles on said arms including means for propelling the vehicle away from its associated arm upon an impact with the other vehicle; and means for rotating said shafts.

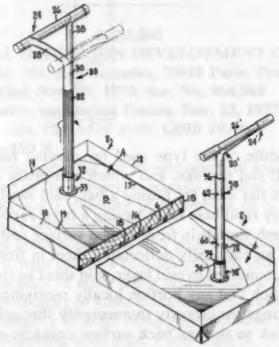
19. A flight vehicle toy comprising a support stand, a first hollow shaft rotatably mounted in said stand, a second shaft coaxial with and rotatably received in said first shaft; a pair of support arms mounted on said shafts for rotation therewith; toy flight vehicles mounted on said arms and means for rotating said shafts and thereby rotating said arms and flight vehicles about the support stand including a pair of electric drive motors operatively connected to said shafts for driving the shafts and means for automatically varying the relative speeds of rotation of said drive motors in response to rotation of one of their respective shafts.

4,222,559

EXERCISING DEVICE

Joseph P. Hammer, 1184 Mackukin, Saint Paul, Minn. 55117

Filed Nov. 6, 1978, Ser. No. 957,793
Int. Cl.³ F16B *12/00*; A63B *13/00*
U.S. Cl. 272—63 **3 Claims**



1. An improved exercising device, which comprises:

(a) a substantially planar base member suited for resting upon a support surface;

(b) two opposed leg members carried on the base member and extending outwardly therefrom, wherein each leg member comprises a single upright shaft having a longitudinal axis therethrough, and further including a substantially horizontal handle at one end of the shaft distally located from the base member and wherein the handle is offset from the axis of the shaft;

(c) means for detachably and adjustably mounting each of the handles relative to the base member in a discrete number of relatively fixed positions, whereby the orientation of the handles and the spacing therebetween can be varied for different exercises;

(d) wherein the shaft and handle of each leg member are unitary with one another, and wherein the detachable mounting means is located at a lower end of the shaft which is proximate to the base member and located opposite to the end of the shaft which carries the handle;

(e) wherein the base member has two spaced and upwardly extending sockets thereon which are suited for receiving therein the lower ends of the shafts, and wherein the lower end of each shaft has means cooperating with the socket for locking each shaft therein;

(f) wherein each socket has a plurality of spaced inwardly extending locking lugs, and wherein the lower end of each shaft has a plurality of L-shaped locking grooves for releasably receiving the locking lugs to lock the shaft relative thereto; and

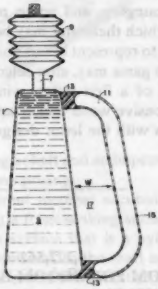
(g) wherein there are four locking lugs and four locking grooves equally spaced around the peripheries of the socket and the shaft such that each leg can be positioned in any one of four discrete positions.

4,222,560

EXERCISER AND REHABILITATIVE GRIPPING DEVICE

Edith O. Hallerman, 41-06 Case St., Elmhurst, N.Y. 11373

Filed Oct. 6, 1978, Ser. No. 949,178
Int. Cl.³ A63B *21/30*
U.S. Cl. 272—68 **7 Claims**



1. A device for being gripped by a human hand and responding to the squeezing thereof by said hand, said device comprising a substantially conically shaped hollow chamber, a hollow bellows, an orifice having one end in communication with said bellows, and the other end in communication with said chamber, a handle means connected to said conical chamber and forming a closed space between the handle means and conical chamber, said space being of a size sufficient to retain a hand in proximate gripping location to said chamber even though the hand is not actually gripping said chamber, said chamber being capable of retaining an indicator liquid therein, said chamber having sufficiently flexible walls such that when gripped and squeezed by said hand with sufficient force, a liquid retained

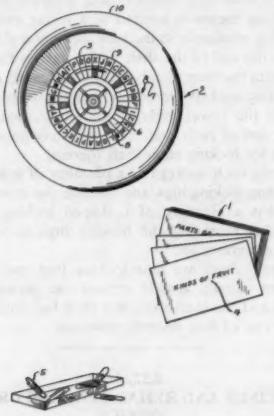
therein will flow from said chamber through said orifice and into said bellows in an amount and to a degree proportional to the amount of force applied by said hand.

4,222,561

GAME DEVICE

Hubert N. Whitten, 449 Hilltop Rd., Elgin, Ill. 60120

Filed Sep. 13, 1978, Ser. No. 942,022
Int. Cl.³ A63F *9/18*
U.S. Cl. 273—1 R **4 Claims**



1. A game device, which comprises: a predetermined set of word category indicia; means for players to select at random one word category indicia at a time; a chance means apparatus for designating the first letter of a word which satisfies the selected word category, and bonus markers selected by said chance means which thereafter may be connected to the word category indicia to represent bonus points for players, whereby any player of the game may, after selection of a word category and designation of a first letter, win competitive points by signaling a responsive word which satisfies the category indicated and begins with the letter designated.

4,222,562

BROOM FOR BROOM BALL GAME

Denys Gardner, 1529 Blvd. Acton, Acton Vale, Quebec, Canada (J0H 1A0)

Filed Dec. 4, 1978, Ser. No. 967,081
Int. Cl.³ A63B *69/14*
U.S. Cl. 273—67 R **11 Claims**

1. A broom for a broom ball game comprising a substantially straight stick having a tapered end portion, an elongated ball striking body having opposite main faces with substantially all of each main face being substantially flat, said main faces progressively widening from one end to the other end of said body, said body having a blind bore extending longitudinally and centrally through a major portion of said body, opening at said one end of said body and complementary to said tapered end portion, the latter securely fitted within said blind bore, said other end of said body forming an outer edge which has at least a substantially straight portion which extends transverse to the longitudinal axis of said stick, said ball striking body

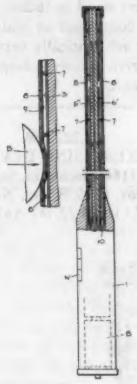
being molded in a one piece from a non-filamentary, moldable substance.

4,222,563

PADDLE FOR PLAYING PLATFORM TENNIS, PADDLE BALL AND THE LIKE

Thomas E. Heftler, and Lois L. Weinroth, both of 440 E. 79th St., Apt. 9G, New York, N.Y. 10021

Filed Mar. 30, 1979, Ser. No. 25,673
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—67 R **5 Claims**



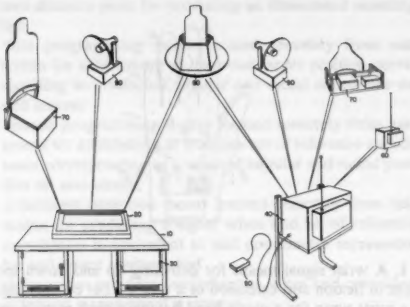
1. A paddle of the type used for playing platform tennis, paddle ball and the like, and which comprises a handle connected to a flat head for hitting a ball, said head comprising a substantially rigid base layer having a front surface, a network of open mesh strands in front of said surface and connected to said layer, an elastically deflectable sheet in front of said network and connected to said layer, said sheet having a degree of elasticity such that any portion locally receiving a ball impact locally springs backwardly momentarily through the mesh of said network so that its back surface contacts said front surface, and means for activating a signal via contact between said surfaces.

4,222,564

AUTOMATED SCORING TARGET SYSTEM

Donnie E. Allen; Robert Kilmer, both of St. Petersburg; Thomas L. Guy, Brandon, and Wesley C. Fosnow, St. Petersburg, all of Fla., assignors to ABA Electromechanical Systems, Inc., Pinellas Park, Fla.

Filed Jun. 13, 1977, Ser. No. 806,309
Int. Cl.[2] F41J *5/00*
U.S. Cl. 273—369 **53 Claims**



1. An automated target scoring system, comprising:
a control panel comprising;
a target status indicator for providing visual indications of target status, and
a target function selection means for generating target function selection signals, and
at least one target assembly comprising;
a target responsive to said target function selection signals,
a plurality of target status signal generation means responsive to said targets operational and physical condition,
a piezoelectric accelerometer responsive to vibration of said target generated by projectile hits,
a hits signal processor responsive to signals generated by said piezoelectric accelerometer for generating hit signals for activation of said target status indicator,
a remote control interface means for conditioning said target function selection signals for transmission to said target assembly and for conditioning said target status signals and said hit signals from said target assembly for application to said control panel; and
a target assembly interface means for conditioning said target status signals and said hit signals for transmission to said control panel via said remote control interface and for conditioning said target function selection signals for application to said target assembly.

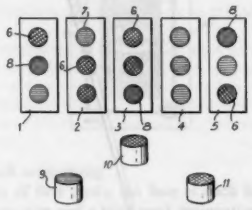
4,222,565

LOGICAL DEDUCTION DEVELOPMENT GAME

Meyer Berrebi, 184, rue Marcadet, 75018 Paris, France

Filed Nov. 29, 1978, Ser. No. 964,583
Claims priority, application France, Dec. 12, 1977, 77 37390
Int. Cl.[3] A63F *9/06*; G09B *19/00*
U.S. Cl. 273—153 R **10 Claims**

1. Educational game for the development of logical deduction on the part of the players, especially children comprising:
a surface having a plurality of assemblies of n number of sequentially arranged areas;
each of said areas being provided with distinctive indicia to identify it with one of a first, second and third category;
the first category of areas being representative of logic 1;
the second category of areas being representative of logic 0;
the third category of areas being representative of a neutral value comprising both logic 1 and logic 0;
the sequence of the arrangement of categories of areas in each of said assemblies being different from the sequence of arrangement of the categories of areas in every other assembly of areas;
n number of mobile playing pieces to be arranged in sequential positions corresponding to the sequential positions of each of said areas;
each of said playing pieces being provided with indicia means representative of logic 1 and logic 0;



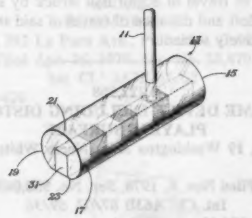
each of said playing pieces being also provided with means to display alternatively said logic 1 or logic 0 indicia when arranged in said sequential positions;
the sequence of the displayed indicia when said playing pieces are arranged in a predetermined sequence being dissimilar to the sequence of indicia displayed by each of said assemblies of areas.

4,222,566

GOLF PUTTER

Troy R. Berry, 4924 Pershing, Fort Worth, Tex. 76107

Filed Aug. 25, 1978, Ser. No. 936,827
Int. Cl.[3] A63B *53/08*
U.S. Cl. 273—164 **1 Claim**



1. A golf putter having a shaft and an improved head secured to the shaft, the head comprising:
an elongated transparent member secured perpendicularly to the shaft, having a front striking surface on one side, a rear surface, a top surface that is a cylindrical segment with an axis perpendicular to the shaft and parallel to the front striking surface, and a substantially flat bottom surface perpendicular to the shaft, the bottom surface having a slot formed therein that extends substantially the length of the putter, the intersections of the bottom surface with the front surface and rear surface being at an obtuse angle with respect to the bottom surface; and
a rectangular metal weight of the same size as the slot, the weight having a substantially flat bottom surface fitting flush with the bottom surface of the transparent member and having contrasting colored lines on its upper surace that are visible from above through the top surface of the transparent member for aiding in alignment;
the top surface of the transparent member creating a parallax effect when viewed from above, causing the markings on the weight to appear to be the full width of the transparent member.

4,222,567

GOLF CLUB WITH LOFT ANGLE MARKINGS

Stephen Shabala, Orlando, Fla., assignor to The John Rouzee Green Co., York, S.C.

Filed Oct. 10, 1978, Ser. No. 949,966
Int. Cl.[3] A63B 53/06, 53/08
U.S. Cl. 273—167 R 5 Claims

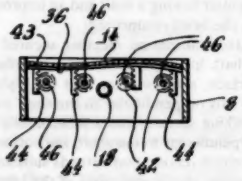
1. In a golf club having a club head presenting a club face for striking a golf ball, said club face having a lower edge, and a shaft extending upwardly from the club head, the improvement comprising a plurality of linear sighting marks located on said club face, each said mark extending toward said shaft in an upward direction with respect to said lower edge of said club face and at a different preselected acute angle with respect to said lower edge of said club face, and each said mark being arranged on said club face at a location to cause said club face to assume a greater angular relation to a vertical plane extending therethrough when said club head is positioned, respectively, to orient each said mark in perpendicular relation to the intended line of travel of a golf ball struck by said club face, whereby the loft and distance of travel of said struck golf ball may be selectively varied.

4,222,568

GOLF GAME DEVICE INCLUDING DISTORTABLE PLAYING SURFACE

Olerio Russo, 19 Washington Ave., North White Plains, N.Y. 10603

Filed Nov. 6, 1978, Ser. No. 958,049
Int. Cl.[3] A63B 67/02, 69/36
U.S. Cl. 273—176 H 4 Claims



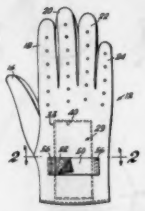
1. A golf practice putting green comprising a platform having a rear reinforced rigid section putting area and a forward bendable floor section, said bendable floor section being provided with a hole therethrough for the reception of a golf ball, and a ball return chute for receiving the ball dropping through said hole, means adjacent to said rear reinforced section for collecting said ball, at least one rigid member located underneath said bendable floor, a rack and pinion arrangement being supported on said rigid member and adapted to engage the unsupported undersurface of said bendable floor for selectively adjusting the contour of said floor, and a shaft operable at the rear reinforced section putting area and connected to said means for adjusting the same.

4,222,569

BENT WRIST SIGNAL DEVICE

Guy J. DeMascolo, 1500 Bay Rd., Miami Beach, Fla. 33139

Filed Oct. 2, 1978, Ser. No. 947,595
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—183 B 6 Claims



1. A wrist signal means for detecting up and down movement in flexion and extension of a user's wrist comprising:

a wrist wrap for a user's hand having a back portion and a front hand portion, the wrist wrap generally defining a glove, and a pocket zone located at the back of the wrist wrap and positioned thereupon such that the pocket zone is substantially beyond the crotch or breaking point between the hand and forearm at the widest portion of the user's hand,

a wrist movement sensor including, a generally flat sound-making article defining a clicker which makes an audible sound emission upon being bent to provide a basis for sound emission upon wrist movement, the clicker in and secured to the pocket zone sensitive to flexion and extension of the user's wrist whereupon an audible signal upon wrist movement is produced,

means for captivating the clicker within the pocket zone defining straps with connecting means,

the straps also comprising means for varying the sensitivity of the clicker to wrist movement, the straps extending from one side of the pocket zone to the other over the pocket zone and thereby over the clicker, and

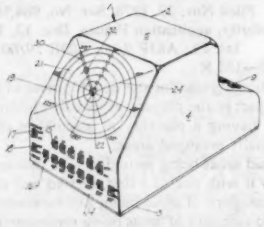
whereby pressure may be varied on the wrist movement sensor without interferring with the movement of the wrist of the user since the straps do not extend and encircle the wrist.

4,222,570

SIMULATED RADAR GAME

Patrick M. Gray, 4934 Cleves Pike, Cincinnati, Ohio 45238

Filed Jul. 3, 1978, Ser. No. 921,788
Int. Cl.[3] A63F 3/00, 7/22
U.S. Cl. 273—237 10 Claims



1. A simulated radar game comprising:

a. a visually sensible display screen comprising an optically

transmissive sheet having a zero distance point, each point on said screen corresponding to a distance coordinate measured radially outwardly from said zero distance point and an angular coordinate corresponding to an angular distance measured from a line extending radially from said zero distance point;

b. scanning means for producing on said display screen a scanning line comprising a linear light source facing said screen and extending radially outwardly from and continuously rotating about a fixed axis extending through said zero distance point for producing an illuminated scanning line;

c. first programming means located remotely from said screen for establishing at least one target position corresponding to a selected angular and radial coordinate on said screen;

d. second programming means located remotely from said screen for establishing at least one set of reference coordinates corresponding to a selected angular and radial position on said screen;

e. coincident detection means located remotely from said screen for producing a signal when said set of reference coordinates is equivalent to said coordinates represented by said target position; and

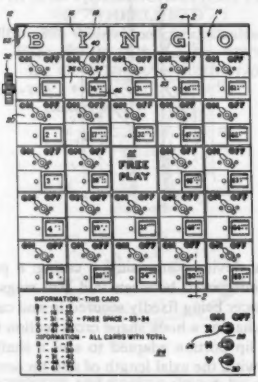
f. alarm means providing an indication when said coincident detection means signal is present.

4,222,571

ELECTRICALLY OPERATED BINGO DEVICE FOR SIGHTED AND SIGHT DISADVANTAGED PEOPLE

Joseph H. Molat, Stratford 36 C, West Palm Beach, Fla. 33409

Filed Nov. 3, 1978, Ser. No. 958,360
Int. Cl.³ A63F *3/06*
U.S. Cl. 273—237 **11 Claims**



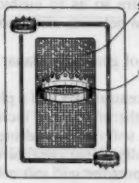
1. A game board assembly comprising a display panel divided into a plurality of zones having window openings therein, register means mounted on each of said zones for displacement to an active position denoting a plurality of arrangements of the zones in predetermined patterns, a plurality of rotatable drums having indicia exposed at the window openings of said zones of the display panel, means interconnecting said register means for registering the patterns formed by those zones of the display panel at which the pattern denoting means are in the active positions, indicating means connected to the interconnecting means for signifying a winning game in response to registration of at least one of the predetermined patterns, and game selection means connected to the interconnecting means for disabling registration of selected ones of the patterns.

4,222,572

CARD DECK AND GAME BOARD

Louis J. Baker, 4601 W. 4th St., Reno, Nev. 89503

Filed Dec. 6, 1978, Ser. No. 966,884
Int. Cl.³ A63F *1/02, 3/00*
U.S. Cl. 273—306 **18 Claims**



1. A card deck comprising:

(a) a plurality of first cards, the face of each having a first color designation and a high card designation thereon,

(b) a plurality of second cards, the face of each having a second color designation and a high card desigantion thereon,

(c) a plurality of third cards, the face of each having a third color designation and a high card designation thereon, wherein said high card designation is the same on all of said first, second and third cards,

(d) a plurality of fourth cards, the face of each having said first color designation and a low card designation thereon, and

(e) a plurality of fifth cards, the face of each having said second color designation and a low card designation thereon,

wherein said low card designation is the same on said fourth and fifth cards.

4,222,573

BOOMERANG

Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94306

Filed Apr. 26, 1979, Ser. No. 33,470
Int. Cl.³ A63B *65/08*
U.S. Cl. 273—426 **7 Claims**

1. A boomerang of generally planar configuration comprising:

a body having a central area and a plurality of wings extending outwardly therefrom, and including an internal plastic

armature and a soft outer covering, said internal armature being of generally planar configuration and disposed so as to provide support for said soft outer covering, said body further including internal reinforcing pads in the tips of said wings, said pads being of generally planar configuration and positioned such that the planes thereof are parallel to the plane of said body and overlap the tips of said internal armature so as to cushion the impact resulting from a collision between said boomerang and a hard surface.

7. A boomerang of generally planar configuration comprising:

a body having a central area and a plurality of wings extending outwardly therefrom, and including an internal plastic armature and a soft outer covering, said internal armature being of generally planar configuration and disposed so as to provide support for said soft outer covering, said internal armature having wing segments extending along said wings, with each said segment including a rim having a central portion spaced apart from distal end of the segment and end portions joining the segment in the vicinity of the outer extremities of the leading and trailing edges thereof, whereby said rim readily deflects and absorbs the impact of a collision between the tip of said boomerang and a hard surface.

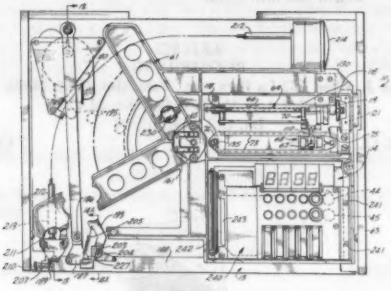
4,222,574
RADIAL-TRACKING PROGRAMMABLE RECORD PLAYER

Robert G. Cheeseboro, 3650 Somerset Dr., Los Angeles, Calif. 90016

Division of Ser. No. 778,027, Mar. 16, 1977, Pat. No. 4,121,836. This application Oct. 16, 1978, Ser. No. 951,563

Int. Cl.³ G11B *17/06*

U.S. Cl. 274—13 R **28 Claims**



1. A record player in which a phonograph record disc is supported in a playing position on a turntable rotatably drivable at a selected speed about an axis, the disc in its playing position being engageable with a stylus supported by a transducer cartridge held in a carriage which is movable in a carriage guide defining a line of carriage movement radially of the turntable above the turntable in response to tracking engagement of the stylus in the spiral groove of the disc, and characterized in that the cartridge is mounted in the carriage for movement in the carriage normal to the turntable, and the record player includes lift means cooperable with the cartridge and selectively operable at any location of the carriage along said line for lifting the cartridge in the carriage away from the turntable, thereby to move the stylus out of engagement with a record on the turntable, the lift means including a first element connected to the cartridge for movement with the carriage along said line and with the cartridge in the carriage, a second element selectively engageable with the first element for moving the cartridge in the carriage, means mounting the second element for movement along a path parallel to said line in cooperative juxtaposition to the first element and for movement into engagement selectively with the first element, and selectively operable means for moving the second element into engagement with the first element at any position of the second element along said path.

6. A record player in which a phonograph record disc is supported in a playing position on a turntable rotatably drivable at a selected speed about an axis, the disc in its playing position being engageable with a stylus supported by a transducer cartridge held in a carriage which is movable in a carriage guide defining a line of carriage movement radially of the turntable above the turntable in response to tracking engagement of the stylus in the spiral groove of the disc, and characterized in that the record player includes sensing means comprising a follower member disposed adjacent the carriage, mounting means for mounting the follower member for movement along a path parallel to said line for following the movement of the carriage along said line during record playing engagement of the stylus with a record, follower member drive means operable for driving the follower member along said path, the sensing means being operable for sensing the relative positions along said line and said path of the carriage and the follower member and for generating a signal indicative thereof.

4,222,575
SHAFT SEAL DEVICE

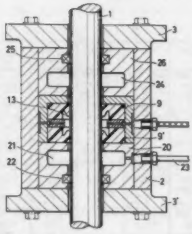
Yoshikazu Sekiguchi, Kounosu, and Kenji Asano, Ageo, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,387

Claims priority, application Japan, Mar. 23, 1978, 53-36183[U]

Int. Cl.³ F16J *15/32, 15/46*

U.S. Cl. 277—59 **7 Claims**

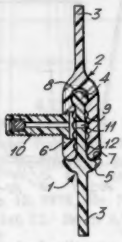


1. A shaft seal device comprising; a casing; a pair of seal rings; a spacer interposed between said seal rings, said seal rings and said spacer being fixedly secured in said casing; each of said seal rings having a hook shape cross section to provide a radially inner lip portion adapted to seal a shaft slidingly contacting therewith, the axial length of said lip portion being shorter than that of the outer peripheral surface of said seal ring, and a root portion of said lip portion having an axial thickness of $\frac{1}{4}$ to $\frac{1}{3}$ of an axial length of said outer peripheral surface of said seal ring, and the inner peripheral surface of said lip portion being tapered with respect to said shaft at an angle in the range of 3° to 5°; said rings being symmetrically positioned with respect to said spacer so as to confront said lip portion of one of said seal rings with said lip portion of the other seal ring to provide a sealing liquid chamber between said shaft, said spacer and said lip portions; liquid seal passages formed in said spacer to introduce sealing liquid into said sealing liquid chamber and to fill said chamber with said sealing liquid under pressure, whereby said sealing liquid filled in said sealing liquid chamber urges said lips radially inwardly to provide pressing contact of said lips with said shaft in combination with a resiliency of said lips.

4,222,576
SEALING DEVICE

Harold J. Clements, Canterbury, England, assignor to Modern Precision Engineers and Associates Limited, Ashford, England

Filed Feb. 6, 1979, Ser. No. 9,790
Claims priority, application United Kingdom, Feb. 7, 1978, 4922/78
Int. Cl.[2] B65D *53/04;* F16J *15/02*
U.S. Cl. 277—237 R 19 Claims

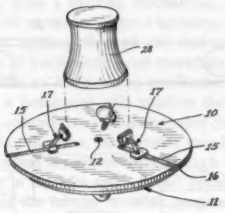


1. A sealing device comprising two interengageable elongate members of which at least one has a resilient sealing surface extending therealong for sealing engagement with the other member, the two members being arranged to define a substantially enclosed space extending lengthwise therebetween when they are interengaged, and means associated with one of the members for evacuating said space so as to cause sealing engagement of the two members along their lengths.

4,222,577
CENTERING AND HOLDING DEVICES FOR POTTER'S WHEELHEAD

Brian K. Giffin, 890 Willowbrook Ave., Boulder, Colo. 80302

Filed Jul. 19, 1978, Ser. No. 925,924
Int. Cl.[3] B23Q *3/06;* B23B *31/00*
U.S. Cl. 279—114 1 Claim

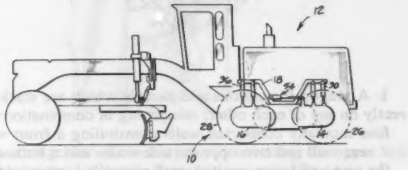


1. In a centering and holding device for attachment to a potter's wheelhead, a bottom plate having a plurality of clamping brackets on its undersurface and also having a spiral formation on its top surface, a top plate adapted to be releasably secured to the bottom plate centrally of the plates, whereby said releasable securement of the plates is such as to permit relative rotation of the plates, a plurality of radial slots in the top plate extending through the plate from the top surface to the bottom and from a short distance spaced outwardly from the center to the periphery, a sliding arm positioned in each radial slot and having a depending portion of sufficient length to engage and co-act with the spiral formation on the top surface of the bottom plate, said releasable securement of the top plate with the bottom plate being provided by a collar member depending from the under surface of the top plate centrally thereof, said bottom plate having a central opening for receiving the collar member and which extends through the same to project a short distance below the bottom plate, a groove provided in the projecting end of the collar member, and an O-ring located in the groove.

4,222,578
TANDEM WHEEL PROPORTIONING ARRANGEMENT

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 6, 1978, Ser. No. 883,603
Int. Cl.[2] B60G *17/00*
U.S. Cl. 280—6.11 10 Claims



1. In a tandem wheel arrangement which comprises a first and a second lever each pivotally mounted to a vehicle frame at first and second lever pivots, respectively, said first and second pivots having generally horizontal axes generally perpendicular to the longitudinal axis of said vehicle frame, said levers extending from a side of said vehicle frame, a first roadwheel mounted for rotation to said first lever and a second roadwheel mounted for rotation to said second lever, each of said roadwheels being longitudinally spaced from the lever pivot thereof, an improvement comprising:

main first cylinder means;

means for attaching said main first cylinder means to extend from said frame to said first lever at a position spaced from said first lever pivot;

main second cylinder means;

means for attaching said main second cylinder means to extend from said frame to said second lever at a position spaced from said second lever pivot;

auxiliary first cylinder means;

means for attaching said auxiliary first cylinder means to extend from said frame to said first lever;

auxiliary second cylinder means;

means for attaching said auxiliary second cylinder means to extend from said frame to said second lever; and

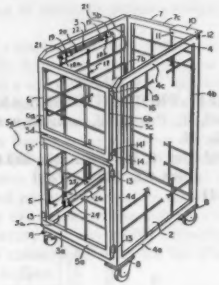
load proportioning valve means for fluid flow interconnecting an expansion end of each of said main first with said main second cylinder means and an expansion end of said auxiliary first cylinder means with an expansion end of said auxiliary second cylinder means responsive to the first and second roadwheels being substantially level, the expansion ends of the main first cylinder means and the auxiliary second cylinder means to sump means and the expansion end of the main second cylinder means with the expansion end of the auxiliary first cylinder means responsive to the first roadwheel being elevated relative to the second roadwheel, and the expansion ends of the main second cylinder means and the auxiliary first cylinder means to said sump means and the expansion end of the first cylinder means with the expansion end of the auxiliary second cylinder means responsive to the second roadwheel being elevated relative to the first roadwheel.

4,222,579

NESTABLE TROLLEY WITH VOLUME REGULATION

Tom Frydendal, Oslo, Norway, assignor to Elopak A/S, Spikkestad, Norway

Continuation-in-part of Ser. No. 829,089, Aug. 30, 1977, abandoned. This application Jun. 20, 1978, Ser. No. 917,402
Claims priority, application Norway, Aug. 31, 1976, 762990
Int. Cl.[2] B65D *7/26*
U.S. Cl. 280—33.99 H **15 Claims**



1. A wagon for cartons and parcels which are stacked directly on top of each other, comprising in combination:

four mutually connected walls constituting a front wall, a rear wall and two opposite side walls, and a bottom

the rear wall being a unitary wall pivotally connected to one adjacent side wall to swing about a vertical axis to provide unrestricted loading access to the loading area of the wagon,

the front wall having a lower stationary portion and an upper door portion which extends the full width of said front wall and which has an opened position to provide an additional access opening for the contents in the wagon without significantly increasing the outer dimensions of the wagon, the lower stationary portion of said front wall providing securing for objects in the wagon to be maintained in position when said upper door portion of the front wall is opened,

at least one of the rear and side walls comprising a size regulating means for permitting adjustment of said one wall parallel to itself for varying at least one of the dimensions of the wagon depending on the floor space occupied by the pile of cartons to be held in the wagon, and

means at said bottom for transport of the wagon on a ground surface.

4,222,580

REFUSE BAG HOLDER ASSEMBLY

Joseph Krokonko, 102 Robeson Dr., Coraopolis, Pa. 15108

Filed Jun. 29, 1978, Ser. No. 920,464
Int. Cl.[3] B62B *1/00*
U.S. Cl. 280—47.34 **3 Claims**

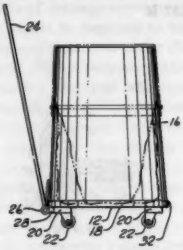
1. A holder assembly for refuse bags having open and closed ends, comprising:

a generally dish-shaped base member for supporting the closed end of a refuse bag, said base member having an upwardly extending flange on its periphery and a solid bottom portion;

frusto-conically shaped refuse bag support means removably supported by said base member with the larger end in engagement with said base member, said larger end being sized to snugly engage the inside of said flange, said bag support means being sized and shaped such that a refuse bag is removably received therein with the closed end of the bag engaging said solid portion of said base member and the open end portion of the bag extending outwardly of the upper end of the support means enough to fold over to engage and be secured by an upper portion of the support means, the support means being further sized and shaped such that the lower section of the support means would be out of engagement with a filled refuse bag;

ground engaging transport means operatively supported by said base member; and

locking means for selectively locking said bag support means to said base member, said locking means comprising said



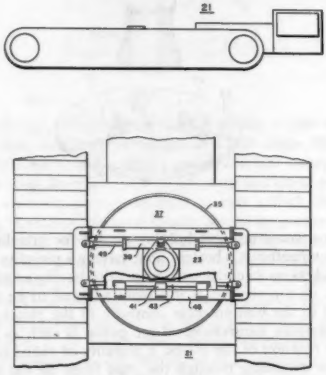
flange defining a generally L-shaped slot open at the upper lip section of the flange, and a pin member secured to the lower section of said bag support means and receivable within said slot whereby when said pin is initially inserted in said slot and the bag support means rotated the pin will follow the slot to its end and said bag support means and base member will be locked with respect to each other.

4,222,581

APPARATUS AND METHOD FOR MOVING A LARGE OBJECT

Walter L. Treadwell, Piedmont, and Kenneth F. Dewing, Benicia, both of Calif., assignors to Rigging International, Oakland, Calif.

Filed Apr. 7, 1978, Ser. No. 894,397
Int. Cl.[2] B60P *1/00*
U.S. Cl. 280—81 R **21 Claims**



1. Apparatus for moving a large object comprising

four crawler transporters,

hydraulic lift means mounted on the top of each transporter and secured to the object,

a horizontal sliding mount disposed on top of each of the transporters to permit the lower ends of each of the hydraulic lift means to move with respect to its transporter, two of said lift means being free to move in any direction

when subjected to side loading which exceeds the frictional engagement of the lift means with the mount,

a pair of movement restraints disposed on the top of the sliding mounts of the other two of the transporters and formed to restrain movement of the object in all directions relative to the effective center of the four transporters when they are supporting the object, and

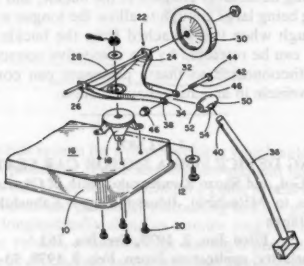
a hydraulic interconnection between at least two of the lift means to permit both to float interdependently under load.

4,222,582

COASTER WAGON WITH SAFETY CAP

Roger Tonelli, Elmwood Park, and Fredrick Michelau, Des Plaines, both of Ill., assignors to Radio Steel & Mfg. Co., Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,210
Int. Cl.[2] B62B 9/20
U.S. Cl. 280—87.02 R **4 Claims**



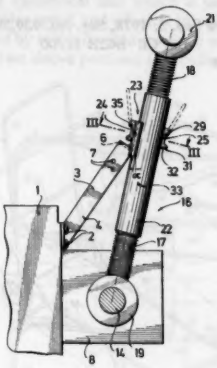
1. In a coaster wagon having a handle adapted to be secured at one end portion between spaced tabs on a portion which extends forwardly from a steering mechanism, in which the tabs are formed with crosswise aligned openings for crosswise alignment with an opening through the end portion of the handle for passage of a connecting rod therethrough pivotally to secure the handle to the steering mechanism for rocking movement about a horizontal axle relative thereto, the improvement which comprises a tubular member dimensioned to be received between the tabs, said tubular member having an axial passage extending crosswise therethrough for alignment with the openings in the tabs and a radial opening extending from the surface of the tubular member perpendicular to the axial passage for a distance into the tubular member to extend beyond the passage but less than the diameter of the tubular member to receive the end portion of the handle in telescoping relation and a depth to extend beyond the axial passage to enable insertion of the handle end portion into the opening to align the crosswise extending opening with the axial passage of the tubular member and tabs, the securing rod extending through the aligned openings of the tabs, the tubular member and handle portion to secure the handle and tubular member to the steering mechanism, the tubular member being dimensioned to have a length corresponding to the spaced relation between the tabs to be received in fitting relation therebetween and a radius in the end portions adjacent the tabs which is greater than the distance between the opening through the tabs and the end portions of the tabs so that the tubular member extends radially beyond the tabs whereby the tubular member functions as a curvilinear bump at the point of interconnection between the handle and the steering mechanism.

4,222,583

UPPER LINK STORAGE DEVICE

Dieter Schillings, Bundesrepublik, Fed. Rep. of Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 27, 1978, Ser. No. 964,024
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 7735912[U]
Int. Cl.[3] B60D 1/14
U.S. Cl. 280—461 A **4 Claims**



1. A storage device for temporarily arresting the upper link of a three-point hitch on a farm tractor comprising;

a bracket including a crossbar with a downward depending leg on each end attached to said tractor;

said crossbar being positioned between said link and said tractor to preclude contact therebetween when said link is rotated upwardly toward said tractor;

post means secured to said crossbar;

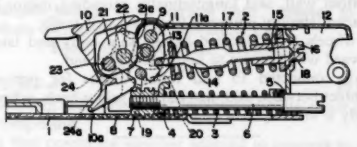
a sleeve slidably retained on said upper link and capable of being slid over said post to positively arrest said upper link.

4,222,584

SKI BOOT HEEL BINDING

Toshikazu Kikuchi, Nagareyama, Japan, assignor to Hope Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,831
Claims priority, application Japan, Feb. 8, 1978, 53-13142
Int. Cl.[2] B63C 9/08
U.S. Cl. 280—626 **4 Claims**



1. A ski boot heel binding comprising a base plate adapted to be attached on a ski plate, a supporting frame body mounted on said base plate, a heel engaging jaw member pivotably connected to said frame body, a first cam member swingably connected to said frame body, a spring for urging said cam member forwardly, and means associated with said cam member for normally depressing said jaw member downwardly, wherein said means comprises a second cam member rotatably connected to said frame body in front of said first cam member, said second cam member having a transverse rod slidably engaged with a recess formed in the rear part of said jaw

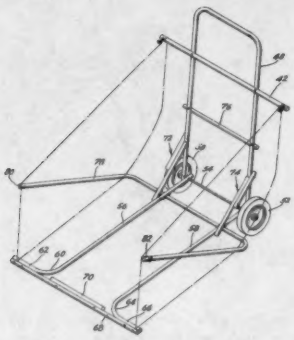
member, said second cam member acting upon said first cam member to swing back the latter against said spring when said second cam member is rotated by the upward movement of said transverse rod engaging with said recess in said jaw member.

4,222,585

FOLDING CART

William R. Crothers, 424 W. Springfield Rd., Springfield, Pa. 19064

Filed Sep. 5, 1978, Ser. No. 939,398
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—654 **9 Claims**



1. A folding cart comprising:

a scoop-shaped body of flexible sheet material, said body, when in an opened condition, having an open front, a bottom wall, a rear wall, and side walls extending upwardly from the bottom wall;

a pair of wheels rotatable on an axis located adjacent the intersection of said rear wall and said bottom wall;

frame means comprising a first substantially rigid frame member extending substantially from the front edge of said bottom wall to said axis, and a second substantially rigid frame member extending substantially from said axis at least to the upper edge of said rear wall;

said first and second frame member being pivotally connected together substantially at the location of said axis, whereby the upper edge of said rear wall can be brought into close proximity to the front edge of said bottom wall;

said first frame member comprising means extending longitudinally from the front edge of said bottom wall substantially to the location of said axis, and providing support for said bottom wall from the front edge to the rear of said bottom wall, said longitudinally extending means being spaced laterally inwardly from said side walls;

said wheels being located behind said body and laterally inward with respect to said side walls; and

means, connected to said frame means for preventing contact between said material and said wheels, when said body is in its opened condition.

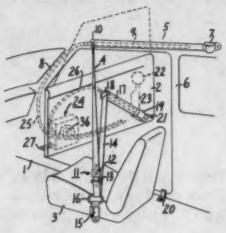
4,222,586

PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

Juichiro Takada, 3-12-1, Shinmachi Setagayaku, Tokyo, Japan

Filed Apr. 27, 1979, Ser. No. 33,568
Claims priority, application Japan, Jul. 10, 1978, 53-93944
Int. Cl.² A62B *35/00*
U.S. Cl. 280—803 **3 Claims**

1. In a passive vehicle occupant restraint belt system having a shoulder belt retractor affixed to the vehicle roof above, behind and outboard of a seat, a lap belt retractor affixed to the vehicle door adjacent the lower rear corner thereof, a shoulder belt leading from the shoulder belt retractor to and through a transfer ring which is movable along a path along the roof generally above the door and thence across to the inboard side of the seat, a lap belt leading from the lap belt retractor to and through a transfer ring movable along the door and thence across to the inboard side of the seat, and a D-ring at the inboard side of the seat, the improvement comprising a buckle affixed on the inboard end of one of the belts and a tongue



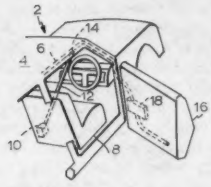
affixed on the inboard end of the other of the belts, the end of the belt with the tongue passing through the D-ring, the tongue being detachably coupled to the buckle, and the hole in the D-ring being large enough to allow the tongue to be pulled back through when it is detached from the buckle, whereby both belts can be retracted by the respective retractors when they are disconnected so that a passenger can conveniently leave the vehicle in an emergency situation.

4,222,587

DRIVING DEVICE FOR A MOTOR CAR SEAT BELT

Yoshihiro Goi, and Shozo Kamiharako, both of Okazaki, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 762
Claims priority, application Japan, Feb. 9, 1978, 53-14443[U]; Nov. 28, 1978, 53-146842
Int. Cl.² B60R *21/10*
U.S. Cl. 280—804 **15 Claims**



1. A driving device for a seat belt for a vehicle, said driving device comprising:

a rack which is slidably supported along its length on one of the vehicle body and a door pivotally supported on the vehicle for being freely opened and closed;

coupling means on said rack for coupling said rack to the other of the vehicle body and the door, said rack being laterally offset from the pivotal axis of pivotal movement of the door with respect to the vehicle body for causing relative displacement of said rack along its length when said door is opened and closed;

a rotatable pinion which meshes with said rack; and

a seat belt supporting member coupled to said pinion for moving from a restraining condition when said door is closed to a non-restraining condition when said door has been opened to a predetermined angle, said rack and said pinion having notched portions thereon wherein there are

no teeth which mesh thereby stopping rotation of said pinion regardless of further movement of said rack when said respective notched portions are opposite to each other, said predetermined angle corresponding to the position wherein said notched portions first oppose each other.

4,222,588

SEATBELT SYSTEM

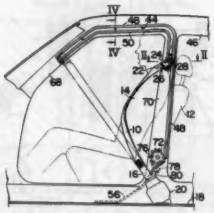
Ichiro Suzuki; Masanao Motonami, and Hisashi Ogawa, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1979, Ser. No. 37,157

Claims priority, application Japan, Aug. 18, 1978, 53-114160[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **10 Claims**



1. A seatbelt system for a motor vehicle which automatically fastens the passenger restraining belt around and removes the belt from a passenger which includes a guide means coupled to an outer end of said passenger restraining belt for guiding said outer end longitudinally along an interior roof side member of said motor vehicle, a flexible tape having a plurality of apertures therein which cooperates with said guide means to cause said guide means to move longitudinally and a driving mechanism for driving said flexible tape, said guide means comprises:

a runner piece which anchors said outer end of said passenger restraining belt;

a runner gear which is rotatably coupled to said runner piece, said runner gear engaging with said plurality of apertures in said flexible tape;

a guide rail fastened to said vehicle body for guiding said runner piece along the length of said guide rail; and

a linear guide gear provided in said guide rail which engages with said runner gear whereby movement of said flexible tape causes said runner gear to rotate and said runner piece to move along said guide rail.

4,222,589

COUPLING MEANS FOR AN INSTALLATION FOR REFRIGERATING CONTAINERS

Daniel G. Calle, Montivilliers, and Jacques M. G. de Gaufridy de Dortan, Le Havre, both of France, assignors to Compagnie Generale d'Entertien et de Reparation Coger, Le Havre, France

Filed Oct. 3, 1978, Ser. No. 948,313

Claims priority, application France, Apr. 5, 1977, 77 10261

Int. Cl.² F16L *55/00*

U.S. Cl. 285—9 R **7 Claims**

1. Sealing coupling means, especially intended for sealingly connecting openings provided in walls which are disposed facing each other and which may be at a variable distance from each other, said coupling means comprising:

a fixed portion which is fixed with respect to one of said walls, said fixed portion comprising:

a first sleeve portion which leaves an opening in said first wall,

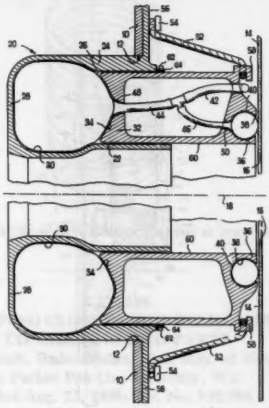
a second sleeve portion which is fixed with respect to said first wall and which surrounds said first sleeve portion, providing an annular space between said two sleeve portions,

a transverse wall connecting said two sleeve portions and limiting said annular space at one end thereof, and

an inflatable envelope disposed at the bottom of said annular space; and

a movable portion, said movable portion comprising:

an annular cylindrical unit which is partially housed in said annular space, and which is capable of being axially displaced by said inflatable envelope while being guided by said two sleeve portions, said cylindrical unit having



a hollow wall with at least one first axial opening at one axial end communicating with said hollow opening and the exterior of the unit, and at least one second axial opening at the other end communicating with said hollow wall and the exterior of the coupling means, passage means for carrying compressed air connected to said inflatable envelope, said passage means extending through said hollow wall and said axial openings in said cylindrical unit, and

sealing means provided at the end of said cylindrical unit which is opposite said closed end of said annular space, said sealing means being capable of being applied around the opening provided in said second wall.

4,222,590

EQUALLY TENSIONED COUPLING APPARATUS

John Regan, Rancho Palos Verdes, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed Feb. 2, 1978, Ser. No. 874,622

Int. Cl.² F16L *55/00*

U.S. Cl. 285—14 **10 Claims**

1. Coupling apparatus for releasably coupling a pair of conduits comprising:

(a) a first connector member adapted to connect to one of the conduits on one end and having a flange on the other end, said flange having a plurality of radially spaced holes therethrough;

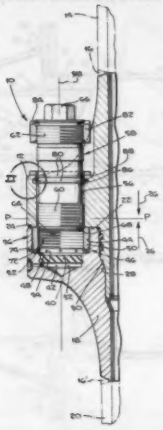
(b) a second connector member adapted to connect to the other end of the conduits on one end and having a flange on the other end, said flange of said second connector member being adapted to mate with said flange of said first connector member when the two conduits are disposed in end-to-end relationship;

(c) a plurality of connector pins carried by said flange of said second connector member on one end and means connecting said one end to said flange of said second connector member, said pins having threads on the opposite end, said

pins being disposed to pass through said holes with said threads projecting therefrom, said pins further being hollow cylinders filled with a first fluid and having sidewalls sufficiently thick to resist lateral deformation and only extend the pin when said first fluid is pressurized;

(d) a plurality of nuts adapted for threaded engagement with said threaded ends; and,

(e) means for internally exerting an identical longitudinal extending force on said pins whereby said nuts can be threaded onto said threads of each of said pins to snug engagement with said flange of said first connector member with said pins under said longitudinal extending force



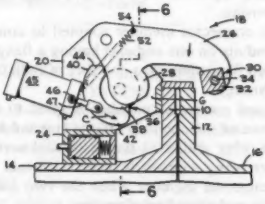
whereby with said longitudinal extending force removed therefrom all said pins are under identical tension, said extending force exerting means comprising a passageway filled with a second fluid disposed in pressure transmitting communication with said first fluid in each of said plurality of pins at respective interfaces thereof, said passageway being adapted for connection to a source of hydraulic pressure whereby upon connection of said passageway to a source of hydraulic pressure equal forces are transmitted through said second fluid to said first fluid and all said pins simultaneously so that said pins are subjected to an equal internal expanding force only by said first fluid under pressure.

4,222,591

MECHANISM FOR CLAMPING PLATES

Frank P. Haley, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 2, 1978, Ser. No. 882,715
Int. Cl.[2] F16L *23/00*
U.S. Cl. 285—18 **8 Claims**



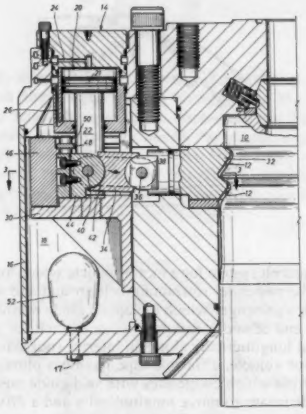
1. Apparatus for securing together the end flanges of two adjacent pipes comprising a clamp member having two jaws to embrace with clearance said two flanges, means for rotatably mounting said clamp member adjacent said flange, a rotary wedge member received between one of said jaws and the adjacent flange, and means to rotate said wedge member into the gap between said one jaw and said adjacent flange causing said clamp member to rotate and to force the other jaw against the other flange to clamp the flanges together between said wedge member and said other jaw.

4,222,592

TOGGLE MECHANISM CONNECTOR

Kenneth C. Saliger, and Martin B. Jansen, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,981
Claims priority, application United Kingdom, Jul. 11, 1977, 28947/77
Int. Cl.[3] F16L *37/08*
U.S. Cl. 285—18 **8 Claims**



1. In a connector for connecting and disconnecting two members in which the first member includes a locking notch and the second member includes a double acting longitudinally moving piston for moving locking dogs into and out of the locking notch, the improvement of a locking toggle mechanism comprising,

said dogs slideably carried by the second member for transverse movement toward and away from said second member for engagement and disengagement with the locking notch, and

a toggle linkage having a first pivot connection connected to the dogs and a second pivot connection longitudinally actauted by the piston whereby the longitudinal movement of the second pivot connection transversely moves said locking dogs and moves the second pivot connection past the first pivot connection into a past dead center locking position.

4,222,593

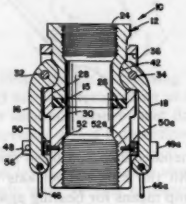
FLUID-CONVEYING COUPLING WITH SAFETY LOCKING DEVICE

Robert F. Lauffenburger, 726 Cobham Park Rd., Warren, Pa. 16365

Filed Apr. 5, 1979, Ser. No. 27,604
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—85 **10 Claims**

1. In a coupling, a fluid passage-defining male coupling member, a fluid passage-defining female coupling member for receiving said male coupling member, and at least one coupling and locking assembly comprising a coupling lever pivotally mounted on said female coupling member for selective pivotal

movement between angularly spaced apart coupling and uncoupling positions about an axis extending transversely with respect to the longitudinal axes of said coupling members, means positioned on said lever for engaging a portion of said male member upon displacement of said lever to said coupling position to releasably couple said male and female coupling members together, said lever being swingable to its uncoupling position for uncoupling said male and female coupling members from each other and safety lock means for releasably locking said lever in its coupling position and including a support structure rigid with said female coupling member, a locking member supported by said support structure for reciprocal movement along a path extending transversely with respect to said lever, said locking member being displaceable



along said path to a locking position where it overlies said coupling lever when the coupling lever is in its coupling position to block pivotal movement of said coupling lever towards its uncoupling position, said locking member further being retractable from said locking position to a release position where it releases said coupling lever for pivotal movement from its coupling position to its uncoupling position, manually manipulatable lever means supported on said support structure for pivotal movement in oppcsite directions, said lever means engaging said locking member and being pivotable in a preselected direction to displace said locking member along said path from said locking position to said release position, and biasing means acting on the assembly of said lever means and said locking member for yieldably urging said locking member to said locking position.

4,222,594

SWIVEL COUPLINGS

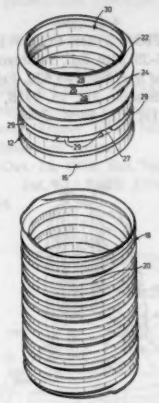
Harcourt J. Skinner, Weston, Canada, assignor to Daymond Limited, Mississauga, Canada

Filed Jul. 10, 1978, Ser. No. 923,144

Int. Cl.[2] F16L *27/00*

U.S. Cl. 285—280 **30 Claims**

1. For use to form a coupling between lengths of pipe, a male component having at least one annular rib on the outer surface of the male component and a female component having at least one annular groove corresponding in number to the number of annular ribs, one for each rib, to accommodate the at least one annular rib when the coupling is made to permit free rotation of the at least one annular rib in the at least annular groove when the coupling is made, and means to facilitate the entry of the rib into the groove, said means comprising at least one groove or slot corresponding in number to the number of annular ribs disposed at an angle between about 65° and about



80° to the longitudinal axis intersecting the at least one annular groove.

4,222,595

CLAMPING CLOSURE FOR RELEASABLY CONNECTING TWO PARTS

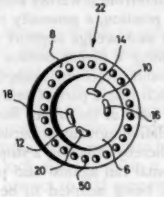
Guenther Schmidt, Baden-Baden, Fed. Rep. of Germany, assignor to The Parker Pen Co., Janesville, Wis.

Filed Aug. 22, 1978, Ser. No. 935,795

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738122

Int. Cl.[2] E05C *19/08*

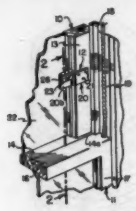
U.S. Cl. 292—91 **19 Claims**



1. Fastener for the detachable connection of two members, particularly for the detachable connection of the closing flap of cases, folders, writing cases or the like with the structure forming the main body, with a lower part having a spring and an upper part which comes into detachable locking engagement with the spring on pressing together the upper part and the lower part, the improvement comprising: the lower part having a base plate (22) provided with four peripherally arranged openings (14, 16, 18, 20) therethrough which are arranged in pairs and incorporate webs (10, 12) therebetween, a cap (34) provided with four resilient attachments (24, 26, 28, 30) corresponding to the openings (14, 16, 18, 20), connectable with the base plate (22) solely by pressing the attachments into the openings (10, 12) said cap having a partly cylindrical peripheral wall (32) of a lesser height than the attachments (24, 26, 28, 30), and a slotted annular spring (36) within said cap with two oppositely facing peripheral projections (38, 40) which, project radially and resiliently outwardly of the outer periphery of the cap (34) over the web areas (10, 12); and an upper part having a clamping plate (42) with a circular opening substantially corresponding to the external diameter of the cap (34), whereby the opening (44) edge facing the lower part defines an annular surface (46) for pressing in the peripheral

projections (38, 40) of the annular spring (37) and for engaging between the latter and the base plate 22.

4,222,596
VENTILATION STOP FOR WINDOWS
John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357
Continuation-in-part of Ser. No. 765,632, Feb. 4, 1977, Pat. No. 4,103,947. This application Jul. 13, 1978, Ser. No. 924,179
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—342 **3 Claims**



1. In combination with a double-hung window having a upper and a lower sash mounted for sliding vertical movement relative to each other, said upper and lower sashes having each respectively horizontal upper and lower and vertical side rails, a ventilation stop mounted to a side rail of the upper window sash a predetermined distance above the upper horizontal rail of the lower sash, said stop comprising a generally rectangular mounting plate, means for securing said mounting plate in a normally installed position to said side rail such that a section of said mounting plate extends from said side rail generally parallel to and above said upper horizontal rail, said section having an upper horizontal edge in said normally installed position, a wedge support plate hinged along one edge to the upper horizontal edge of said section about a horizontal axis to alternately depend therefrom inwardly and toward said lower sash in its operative position, a generally rigid wedge-shaped member attached to said wedge support plate, said wedge-shaped member defining a planar surface connected to said wedge support plate and projecting inwardly therefrom in its operative position such that a part of said planar surface lies toward and into the path of the upper horizontal rail of the lower sash during relative movement between the upper sash and the lower sash thereby effecting a stopping and jamming action of said horizontal rail against said planar surface, said wedge support plate being adapted to be swung about the upper horizontal edge of said section up and over said section to be inclined away from the path of said lower sash sufficiently to prevent said wedge support plate from moving into the operative position during normal movements of said sash, and means limiting the inclination of said wedge support plate in said inoperative position.

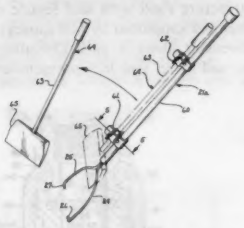
4,222,597
REFUSE COLLECTING DEVICE
J. Don Willis, 301 E. Lawrence Rd., Phoenix, Ariz. 85012
Continuation-in-part of Ser. No. 882,363, Mar. 1, 1978, Pat. No. 4,149,745. This application Jan. 5, 1979, Ser. No. 1,358
Int. Cl.[2] A01B *1/04*
U.S. Cl. 294—1 BA **10 Claims**

1. A manually operated refuse collecting device for collecting refuse in a trailing disposable bag, said device comprising in combination:

(a) a cylindrical scoop having the longitudinal axis thereof extending from the front to the rear for scooping refuse off a surface, said scoop including a forwardly extending snout disposed along the bottom thereof and a rear section for circumscribingly receiving the opening of the bag;

(b) handle means secured to said scoop for manipulating said device, said handle means including detachable paddle means for aiding in directing refuse into said scoop;

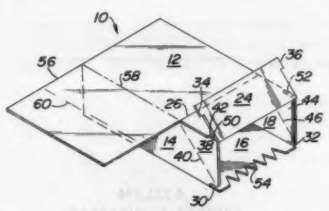
(c) a rearwardly opening guard having a front part secured to a lower cylindrical rear section of said scoop for protecting the bottom front edge region of the bag, said guard including a rear part radially extended from said scoop for defining a channel adjacent the lower bottom surface of said scoop for receiving and retaining the lower front edge region of the bag; and



(d) a resilient member disposed upon said scoop in general alignment with the longitudinal axis of said scoop and including clamp means for bearing against an upper front edge region of the bag to retain the bag attached about the exterior surface at the rear section of said scoop, said resilient member further including attachment means for securing the forward end of said resilient member to said scoop;

whereby, the bag is detachably attached to said scoop by said guard and said clamp means.

4,222,598
CONTAINER
Edward J. Ullger, Babylon, N.Y., assignor to Century Packaging Corp., Amityville, N.Y.
Filed Oct. 12, 1978, Ser. No. 950,942
Int. Cl.[2] A01K *29/00*; B65D *5/08*
U.S. Cl. 294—1 B **10 Claims**



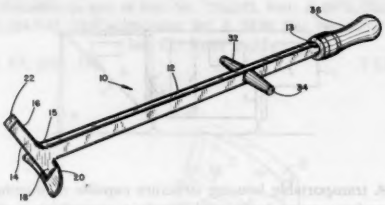
1. A collapsible container having side walls connected to a bottom wall, a top wall integral with a first side wall at a line which permits folding of the top wall with respect to said first side wall, the top wall having first and second panels pivotable with respect to one another, said first panel being generally perpendicular to said first side wall, said second panel being generally parallel to a second side wall opposite said first side wall, said second side wall being longer than said first side wall, at least one locking ear on a third side wall, said locking ear holding said top wall panels in a right angled disposition, a slot at the intersection of said second and third walls at the upper end thereof, said top wall second panel having a tab received within the last-mentioned slot.

4,222,599

DUTCH OVEN LIFTING DEVICE

Myron C. Gale, 592 S. 700 East, and Michael S. Gale, 518 E. St. George Blvd., both of St. George, Utah 84770

Filed Nov. 29, 1978, Ser. No. 964,472
Int. Cl.[2] A47J 49/00
U.S. Cl. 294—12 11 Claims



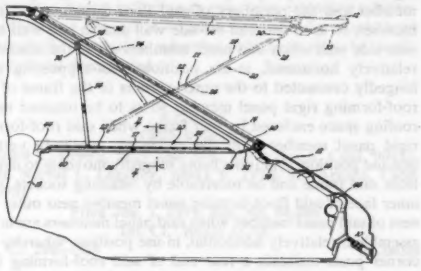
1. A hand-held lifting device comprising
an elongated rod member terminating at a first end,
a prong member secured adjacent said first end of said rod member, comprising a first leg portion and a second leg portion each having a bottom surface,
wherein said first leg portion extends along an axis forming an obtuse angle with an axis extending along said rod member, and said second leg portion extends along an axis forming an acute angle with said axis extending along said rod member,
and a heel member secured on an end of said second leg portion and extending beyond said bottom surface thereof.

4,222,600

VEHICLE STORAGE SPACE COVER ARRANGEMENT

David J. Cripps, Farmington Hills, and Stanley Kwasiborski, Jr., Hazel Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 1, 1979, Ser. No. 8,527
Int. Cl.[2] B60R 5/04
U.S. Cl. 296—37.1 2 Claims



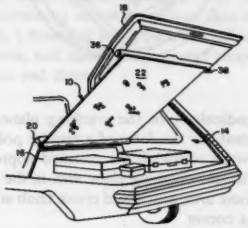
1. The combination comprising, a vehicle having a closure member hinged at an upper edge to provide access by upward swinging movement to a storage space, support means located above and at opposite sides of said storage space, a cover assembly including front and rear panels, one-way hinge means interconnecting the panels to permit back-to-back folding movement of the panels and block face-to-face folding movement thereof, second hinge means hinging said rear panel to the closure member, a pair of laterally spaced straps secured at their lower ends to the front panel and secured at their upper ends to the closure member adjacent the hinged upper edge thereof, said one-way hinge means and said lower ends of said straps and said second hinge means co-operatively locating said panels in generally co-planar relationship and generally at the elevation of said support means in the closed position of said closure member to permit said panels to rest on said support means and cover such storage space and on upward swinging movement of said closure member cause said panels to move with said closure member to a position above said storage space while maintaining said panels in generally co-planar relationship to permit easy and clear access to said storage space.

4,222,601

AUTOMOBILE COMPARTMENT COVER

James E. White, Troy; Ronald S. Gulette, Farmington Hills, and Walter M. Wheeler, Frazer, all of Mich., assignors to Irvin Industries Inc., Stamford, Conn.

Filed Oct. 16, 1978, Ser. No. 950,391
Int. Cl.[3] B60R 5/04
U.S. Cl. 296—37.16 8 Claims



1. In a motor vehicle compartment cover device to be mounted on brackets secured to an automobile and having a cover sheet to be disposed over a compartment in a motor vehicle, said cover device being of the type having an elongated hollow cylindrical roller around which said cover sheet may be wound and to which said cover sheet is anchored, a roller support means to support said roller in the brackets, and a torsion spring disposed between said roller and said support means and operable to generate torsional forces between said roller and said roller support means, the improvement comprising
bracket sensing means operable to generate a first signal in response to the mounting of said device in the mounting brackets, and to generate a second signal in response to the removal of said device from the mounting brackets; and
a lock means connected to said bracket sensing means and disposed between said roller support means and said roller, said lock means being switched in response to said first signal from a lock mode wherein it locks the roller from rotation with respect to said support means, to an unlock mode wherein the roller is free to rotate with respect to said support means; and switched from said unlocked mode to said lock mode in response to said second signal, to restrain loss of torsion in said torsion spring.

4,222,602

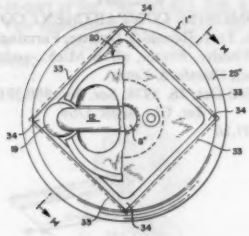
BLOCKING DEVICE FOR HAND CRANK DRIVES ON AUTOMOBILE SLIDING ROOFS

Herbert Kouth, Schoneck, Fed. Rep. of Germany, assignor to Rockwell-Golde G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 879,151, Feb. 21, 1978, Pat. No. 4,155,589.
This application Dec. 4, 1978, Ser. No. 966,175
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2707393
Int. Cl.[3] B60J 7/08
U.S. Cl. 296—137 G 1 Claim

1. A blocking device for hand crank drives on automobile sliding roofs comprising: a crank arm, carrying at its end a crank knob and pivotally attached to a rotatable hub plate fixed to the crank pedestal and capable of being folded in over said crank pedestal into a seating slit of said hub plate and locking in a spring-like manner in its two limiting positions, said crank knob of said crank arm, when said crank arm is in its folded-in

position, being situated in a depression of a dish, which is non-rotatably fixed concentrically to the crankshaft and surrounds said hub plate, having a plurality of depressions disposed at uniform intervals around the circumference of said dish, the walls of said depressions being oriented approxi-



mately perpendicularly to the cranking plane, wherein said dish has substantially the form of a regular polygon, the corner-forming walls of which are oriented approximately perpendicularly to said cranking plane and, in the folded-in position of said crank arm, touch said crank knob at two sides as it is situated in a corner.

4,222,603

MOTOR VEHICLE BODY, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

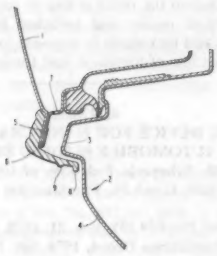
Werner Breitschwerdt, Stuttgart; Hans Götz, Böoblingen; Rudolf Meixner; Rudolf Andres, both of Sindelfingen, and Hermann Möller, Aidlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,307

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651434

Int. Cl.[2] B60J 5/04

U.S. Cl. 296—146 **10 Claims**



1. A motor vehicle body with laterally arranged door means and longitudinal bearer means arranged therebelow, in which an upper area of the longitudinal bearer means projects laterally outwardly beyond the lower area, and the upper area of the longitudinal bearer means is at least partially covered by a cover means and is thus protected against soiling, characterized in that the cover means does not abut at the longitudinal bearer means but extends spaced at a distance from said longitudinal bearer means.

4,222,604

CARAVAN OR CAMPERVAN CONSTRUCTION

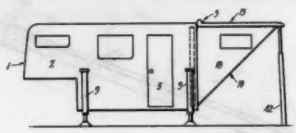
Douglas Human, 119 Pakington St., Kew, Victoria, Australia

Filed Aug. 17, 1978, Ser. No. 934,502

Claims priority, application Australia, Aug. 17, 1977, 1272/77

Int. Cl.[2] B60P 3/34

U.S. Cl. 296—165 **12 Claims**



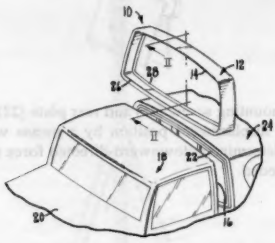
1. A transportable housing structure capable of forming a caravan/campervan body, said structure comprising a cabin unit having a doorway in a side wall and an access opening at a rear end, with an annexe attachment fitted to said rear end of said cabin unit so as to enclose said access opening, said annexe attachment comprising an assembly of a roof-forming rigid panel member hingedly connected to a top portion of said rear end of said cabin unit so as to be hingedly raised from a collapsed, relatively vertical, non-use position to an assembled, relatively horizontal, in-use position, and hingedly lowered from an assembled, relatively horizontal, in-use position to a collapsed, relatively vertical, non-use position, said roof-forming rigid panel member comprising a frame forming the periphery of said panel member and carrying a roofing; a floor-forming rigid panel member hingedly connected to a bottom portion of said rear end of said cabin unit so as to be hingedly lowered from a collapsed, relatively vertical, non-use position to an assembled, relatively horizontal, in-use position, and hingedly raised from the assembled, relatively horizontal, in-use position to a collapsed, relatively vertical, non-use position; a flexible cover member fitted to extend from a side portion of said rear end of said cabin unit, said flexible cover extending from the top to the bottom of said cabin and extending around the periphery of said roof-forming rigid panel member and the periphery of said floor-forming rigid panel member, so as to form an off-side wall and an end-wall and a near-side wall when said panel members are in the assembled, relatively horizontal, in-use position; roof-supporting posts hingedly connected to the outer corners of the frame of said roof-forming rigid panel member so as to be retained near a roofing space enclosed by said frame when said roof-forming rigid panel member is in the collapsed, relatively vertical, non-use position, said posts being hingedly movable to depend from said frame and be receivable by retaining sockets on an inner face of said floor-forming panel member near outer corners of said panel member when said panel members are in said assembled, relatively horizontal, in-use position, whereby said corner posts maintain a rear end of said roof-forming rigid panel member supported on a rear end of said floor-forming rigid panel member when said panel members are in said assembled, relatively horizontal, in-use position; floor-supporting legs hingedly connected to said floor-forming rigid panel member so as to be hingedly movable from a collapsed, non-use position to an assembled, in-use position for engagement with the ground at the rear extremity when said rigid panel member is in said assembled, relatively horizontal, in-use position; said hinged roof-forming rigid panel member disposed outermost at said rear end of the cabin unit, in relation to said hinged floor-forming rigid panel member, when in said collapsed, relatively vertical, non-use position, whereby said hinged roof-forming rigid panel member covers said hinged floor-forming rigid panel member when in that position; and said hinged roof-forming panel member and a bottom of said cabin unit provided with co-acting fastening means for releasably fastening said hinged roof-forming panel member to said bottom of said cabin unit at said rear end when said hinged

roof-forming panel is in said folded, relatively vertical, non-use position.

4,222,605
WINDOW BOOT

Thomas E. Engelhard, 4325 Colfax Ave. South, Minneapolis, Minn. 55409

Continuation-in-part of Ser. No. 738,313, Nov. 2, 1976, Pat. No. 4,114,943. This application Jul. 3, 1978, Ser. No. 921,276
Int. Cl.³ B60P *3/32*
U.S. Cl. 296—166 **7 Claims**

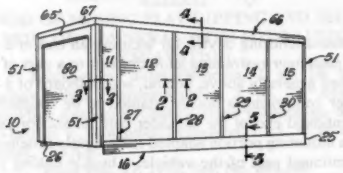


1. A combination including a boot and frame windows or a cab/camper assembly of the type having a rear frame window in the cab and a corresponding front frame window in the forward wall of the camper, said boot comprising a boot frme including a continuous resiliently deformable side wall, said side wall defining an aperture corresponding respectively to said windows in said cab and said camper, said side wall terminating in respective opposite ends, said respective opposite ends each including a thickened resilient continuous lip, each of said lips being adapted to be snap-fit into a corresponding window frame for thereby mounting said boot between said cab and camper, each of said thickened lips including an outwardly extending flange-like projection, said projection cooperating with said side wall to define a water trough, each of said window frames including an exteriorly extending substantially U-shaped channel in which a respective lip of said boot is grippingly receivable whereby said boot may be easily mounted and dismounted.

4,222,606
TRUCK BODY

Raynard C. Brown, 5319 Elm Ave., Long Beach, Calif. 90813, and Norval L. Lopshire, 14441 E. 117th St., Artesia, Calif. 90701

Filed Jun. 1, 1979, Ser. No. 44,496
Int. Cl.³ B62D *33/00*
U.S. Cl. 296—183 **6 Claims**



1. A truck body having a plurality of structurally strong panels, said body comprising:

a floor;

two side rails and a front rail, said side rails and front rail having an upwardly oriented channel having a caulking recess extending at least about half of the height of said channel and located on the inner surface of the outer leg of the channel;

a plurality of structurally strong rectangular panels inserted in the channels of said side rails and said front rail;

a plurality of upright panel-joining rails between adjacent panels, each of said joining rails having a pair of aligned opposingly faced panel-receiving channels, said channels having one flat side and an opposite side which has a recess containing an adhesive-caulking compound, said recess extending over more than half of said opposite side and said recess further extending into the inner surface of said channels;

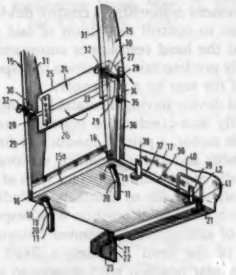
a corner rail at each corner of said truck body, each of said corner rail having two channels positioned at 90° from each other, each channel having at least one adhesive-caulking containing recess in an inner face thereof; and

two side rails, a front rail and a back rail affixed to the tops of said panels, said rails having a panel receiving channel at the lower end thereof.

4,222,607
SEATING

James Dimmock, Stourbridge, England, assignor to The Dimmock Furniture Company Limited, Stourbridge, England

Filed Aug. 23, 1978, Ser. No. 936,180
Claims priority, application United Kingdom, Apr. 10, 1977, 41142/77
Int. Cl.² A47C *3/00*; A47J *47/16*; A47C *1/02*
U.S. Cl. 297—284 **10 Claims**



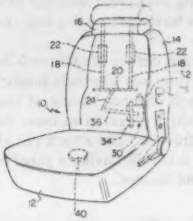
1. An adjustable seating comprising a ground engaging frame portion, a seat part and a back part, means for mounting said seat and back parts on the frame portion, an adjustable lumbar support portion, mounting means for mounting said support portion for movement relative to the back part and means to permit raising and lowering movement of both the front and the rear of the seat part and variation of the angle between the seat part and the back part, wherein said means for mounting said seat and back parts on the frame portion comprises a pivoted link by which the seat part is connected adjacent its rear end to the frame portion and means whereby the forward end is locatable in any desired one of a plurality of locations which lie on a line which extends upwardly and forwardly, the link being inclined upwardly and rearwardly from the frame part to the seat part whereby raising and corresponding forward movement of the front of the seat part causes raising and forward movement of the rear end of the seat part.

4,222,608

CONTROL SYSTEM FOR ADJUSTABLE HEAD RESTRAINT ON AUTOMOTIVE SEAT

Kouzo Maeda, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Tokahana, Japan

Filed Oct. 16, 1978, Ser. No. 951,631
Claims priority, application Japan, Dec. 30, 1977, 52-178391
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—410 **7 Claims**



1. In a system for vertical adjustment of a head restraint on an automotive seat, the system including support members/-which support thereon the head restraint and are movable upwards and downwards, a reversible motor, means for transforming rotation of the reversible motor into a linear motion of a rigid bar, means for transmitting a linear motion of the rigid bar to the support members, a load-sensitive switch attached to the seat and a switching circuit for controlling the action of the reversible motor such that the head restraint is lifted from the lowest position thereof in response to the occupation of the seat by a passenger detected by the load-sensitive switch and is lowered in response to the withdrawal of the passenger from the seat, the switching circuit including a manually operated selector switch to enable manual control of the action of the reversible motor so as to move the head restraint from the automatically lifted position while the seat is occupied by a passenger,

the improvement comprising a control device in said switching circuit to control the action of said reversible motor such that the head restraint is automatically lifted to an optionally predetermined position in response to the occupation of the seat by a passenger,

said control device having a rotatable member formed of an electrically non-conductive material coupled with said reversible motor, a pair of conductors fixed to said rotatable member and a set of contacts stationarily arranged to individually make sliding contact with at least one of said conductors, said set of contacts including a fixed first contact whose angular position with respect to the axis of rotation of said rotatable member determines the lowest position of the head restraint, a fixed second contact whose angular position with respect to said axis of rotation determines the highest position the head restraint can take and a third contact whose angular position with respect to said axis of rotation and said first and second contacts is adjustable from the outside of said switching device and determines said optionally predetermined position of the head restraint.

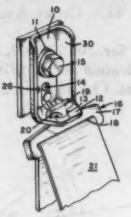
4,222,609

SEAT BELT CONDITION INDICATOR

Arne Andersson, Klippan, Sweden, assignor to Klippan Automotive Products AB, Klippan, Sweden

Filed Jun. 30, 1978, Ser. No. 921,031
Claims priority, application Sweden, Jul. 4, 1977, 7707717
Int. Cl.[2] A47C *31/00*; B60R *21/00*
U.S. Cl. 297—468 **5 Claims**

1. Bracket assembly device for seat belts comprising a bracket (**10, 12**) attachable to the vehicle wall by a through-screw (**15**) characterized in that the bracket comprises a rear plate (**22**) and a front plate (**10**), both of which are made with holes (**23, 11**) for the mounting screw (**15**) and of which the front plate (**10**) forms a slip opening (**18**) for the webbing (**21**) or supports a member (**16**) that forms this slip opening, and that the front plate (**10**) is guided for essentially vertical movement



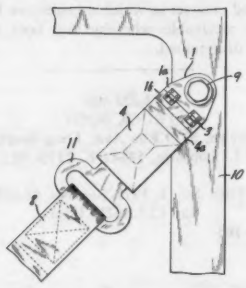
relative to mounting screw (**15**) and rear plate (**22**) but is fixed in an upper displacement position by a means which yields when a predetermined, downward-directed force on the front plate is exceeded.

4,222,610

SEAT BELT ANCHORING DEVICE

Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,870
Claims priority, application Japan, Nov. 29, 1977, 52/159196
Int. Cl.[2] A62B *35/00*; A47C *31/00*
U.S. Cl. 297—483 **1 Claim**



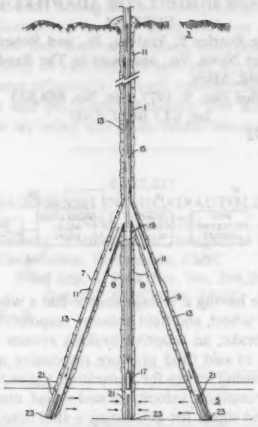
1. A belt-anchoring device for securing an end of a passive vehicle passenger-restraining shoulder belt to a part of a vehicle located generally above, behind, and outboard of a vehicle passenger comprising a buckle adapted to be coupled to the aforementioned end of the shoulder belt; an anchor assembly having a mounting portion adapted to be rigidly fastened to the aforementioned part of the vehicle, a buckle-linking portion, and hinge means connecting the buckle-linking portion to the mounting portion for articulation about an axis located in a generally vertical plane and oriented generally transversely to the axis of the belt when the belt is in the passenger restraining position; and means connecting the buckle to the buckle-linking portion of the anchor assembly for pivotal movement about an axis oriented generally transversely of the vehicle.

4,222,611

IN-SITU LEACH MINING METHOD USING BRANCHED SINGLE WELL FOR INPUT AND OUTPUT

William C. Larson, and Roger J. Morrell, both of Bloomington, Minn., assignors to United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 16, 1979, Ser. No. 66,998
Int. Cl.[3] E21B *43/28*
U.S. Cl. 299—4 2 Claims



1. An in situ leaching mining method employing a combined injection/recovery well for obtaining materials from an ore zone comprising the steps of:

(1) drilling a generally vertical main injection and recovery well so that it is in communication with the ore zone of recoverable minerals;

(2) drilling at least one outwardly extending branch well from said main well at an angle between 2 to 60 degrees from the vertical, the lower ends of said at least one branch well being in fluid communication with and extending into the recoverable ore zone;

(3) inserting a conduit having a lower pump unit into the main well, said pump being capable of recovering a leaching solution that passes through the ore zone and forcing it to the surface;

(4) blocking off the volume between the conduit and the main well below where the at least one branch well intersects it; and

(5) injecting a leaching solution down into said vertical well outside of its conduit to force solution to and through said at least one branch well to the ore zone whereby the pump will cause at least part of the solution with its recoverable minerals to be moved to the surface.

4,222,612

METHOD OF MINING FLAT-DIPPING AND SLOPING BEDS OF A MINERAL WITH HYDRAULIC EXCAVATION

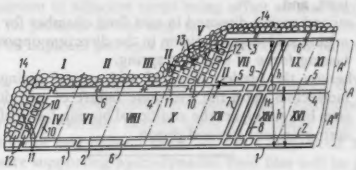
Semen P. Kostovetsky, ulitsa Suvorova, 2, kv. 14; Boris P. Odinokov, ulitsa Chernomorskaya, 2, kv. 21; Anatoly Y. Semenikhin; Anatoly E. Sankov, ulitsa Ushinskogo, 8, kv. 14, and Vladimir V. Soin, ulitsa Sechenova, 7, kv. 38, all of Novokuznetsk, U.S.S.R.

Filed Feb. 27, 1978, Ser. No. 881,386
Int. Cl.[2] E21C *41/04, 45/00*
U.S. Cl. 299—11 6 Claims

1. A method of mining flat-dipping and sloping beds of a mineable mineral with hydraulic excavation of the latter, including the steps of:

dividing a bed of the mineral to be mined into levels, said dividing step including driving a storage drift and a companion drift in the direction of the strata of said bed, and an airway of the service level, and connecting said drifts and said airway with connection holes;

dividing said sublevels into blocks and selecting the width of each block to be short of the value of the limit length of the steady outreach of a cantilever overhang of the main roof of the bed being mined, with the given pattern of cutting into this bed with the cutting drifts and holes defining the short working faces,



setting the spacing in the strata direction of the blocks being mined in the adjacent ones of said sublevels at least equal to the value of the limit length of the steady outreach of the cantilever overhang of the main roof of the bed being mined, with the given pattern of cutting into this bed with the cutting drifts and the holes defining the short working faces, and

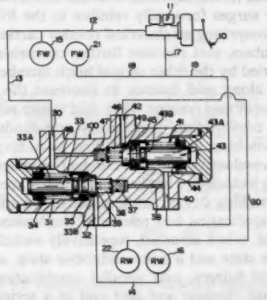
precluding the influence of the bearing rock pressure due to the stoping work being done in either one of said blocks being mined onto another one of said blocks.

4,222,613

PRESSURE CONTROL VALVE ASSEMBLY FOR BRAKE SYSTEMS

Hiroshi Takeshita, Chiryu; Takashi Nagashima, Toyota, and Hiroyuki Kondo, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 27, 1979, Ser. No. 24,257
Claims priority, application Japan, Mar. 27, 1978, 53-35017
Int. Cl.[3] B60T *13/00*
U.S. Cl. 303—6 C 5 Claims



1. A pressure control valve assembly for use in split brake systems having separate pressure lines, comprising in combination:

an inlet port in fluid communication with one of said pressure lines;

a valve subjected to the pressure in said inlet port to control the pressure in an outlet port in fluid communication with one of the wheel brakes and including

a stepped piston,

a valve seat for cooperating with said stepped piston to control communication between said inlet port and outlet port, and

a first spring for normally urging said stepped piston in the direction wherein said inlet port is in fluid communication with said outlet port

thereby controlling the pressure increase of said wheel brake,

a slidable member sealingly fitted in alignment with said stepped position and subjected to the pressure in said outlet port at one end thereof while under the pressure of the other pressure line at the other end thereof,

a fluid chamber formed between said stepped piston and said slidable member and normally connected to said outlet port, and

a second spring disposed in said fluid chamber for normally urging said stepped piston in the direction opposite to the biasing force of said first spring,

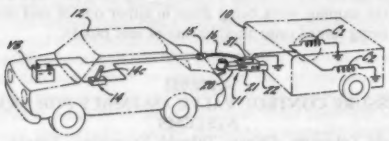
whereby the biasing force of said second spring is made ineffectual upon the hydraulic failure of said other pressure line to impart the additional biasing force of said first spring on said stepped piston.

4,222,614

SURGE CONTROL FOR ELECTRICAL TRAILER BRAKES

John A. Spechko, Elkhorn, Wis., assignor to Warner Electric Brake & Clutch Co., South Beloit, Ill.

Filed Feb. 22, 1979, Ser. No. 13,964
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—20 **6 Claims**



1. An electrical surge braking system for use with a trailer adapted to be connected to a towing vehicle and having a brake which is engaged when an associated coil is energized by a battery carried by the towing vehicle, the vehicles being connected by a first hitch member coupled to the towing vehicle and by a second hitch member coupled to the trailer and movable forwardly relative to the first hitch member when the trailer surges forwardly relative to the towing vehicle, a rheostat comprising an electrical resistor carried by one of said hitch members, said rheostat further comprising an electrical wiper carried by the other of said hitch members and movable relatively along said resistor to decrease the effective resistance value of said resistor when said trailer surges forwardly, a parallel combination of normally non-conductive first and second switching devices, said first switching device being rendered conductive and non-conductive when the brakes of the towing vehicle are applied and released, respectively, said second switching device being selectively actuatable independently of application and release of the brakes of the towing vehicle and, when actuated, repetitively switching between a conductive state and a non-conductive state, and means connecting said battery, said parallel combination of switching devices, said rheostat and said coil in a series path, the improvement in said braking system comprising, a conductor carried by said one hitch member and located adjacent to but insulated electrically from said resistor, said wiper contacting said conductor and being disposed out of conductive contact with said resistor in the absence of surging of said trailer, said wiper conductively bridging said conductor and said resistor during initial surging of said trailer, a controllable switching device connecting said conductor and said resistor in series, the control means for:

(i) rendering said controllable switching device non-conductive when said first switching device is non-conductive and said wiper is in contact with said conductor and is disposed out of conductive contact with said resistor,

(ii) rendering said controllable switching device conductive when said first switching device is conductive and said wiper conductively bridges said conductor and said resistor, and

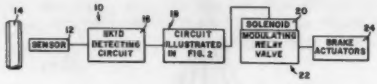
(iii) keeping said controllable switching device conductive until said first switching device is subsequently rendered non-conductive.

4,222,615

LOW VOLTAGE INHIBIT FOR ADAPTIVE BRAKING SYSTEM

Leoncio T. Ang; Bertice E. Walker, Jr., and Robert E. Weber, all of Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 9, 1977, Ser. No. 858,933
Int. Cl.[2] B60T *8/00*
U.S. Cl. 303—92 **14 Claims**



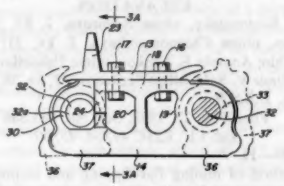
1. In a vehicle having a voltage source and a wheel, a brake controlling said wheel, and fluid pressure responsive means for actuating said brake, an adaptive braking system controlling communication to said fluid pressure responsive means comprising speed sensing means for generating a speed signal as a function of the rotational velocity of said wheel, means responsive to said speed signal for generating a skid detecting signal when an incipient skidding condition of said wheel exists, means responsive to said skid detecting signal for generating a brake pressure command signal, means responsive to said brake pressure command signal for controlling fluid communication to said fluid pressure responsive means, means responsive to the voltage generated by said voltage source to inhibit said brake pressure command signal when the voltage generated by said voltage source drops below a predetermined level, and comparing means comparing said skid detecting signal with a fixed reference signal and generating a control signal when the skid signal and the fixed reference signal are in a predetermined relationship with one another, said control signal enabling said brake pressure command signal generating means to generate the brake pressure command signal in response to said skid signal, said voltage source responsive means changing the value of said fixed reference signal when the voltage produced by said source drops below said predetermined level to thereby prevent generation of the control signal.

4,222,616

ENDPLAY CONTROL GUSSET

Thomas D. Brewer, Tremont, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 18, 1978, Ser. No. 4,794
Int. Cl.[3] B62D *55/20*
U.S. Cl. 305—54 **8 Claims**



1. In a tractor track structure (11) having a pair of parallel spaced links (14,15) defining outer surfaces (26,27) and edge

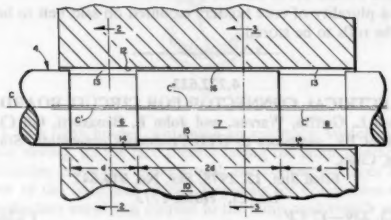
portions (18), a pin (32) extending between said links and having opposite ends (32a) secured thereto, a shoe (13), and securing means (16,17) for securing said shoe to said edge portions of the links, said shoe having outer portions (21,22) extending substantially outwardly of said link outer surfaces, the improvement comprising

a pair of gussets (24,25) carried by said shoe outer portions one each outwardly of the respective ones of said pair of links and each having an inner face (34,35), said inner faces being juxtaposed to said outer surfaces (26,27) of the associated link with said gussets extending substantially tangentially to said ends of said pin whereby said gusset inner faces effectively prevent outward deflection of said links at said pin while permitting free access to the pin ends for servicing and replacement thereof.

4,222,617
SELF LOADING CYLINDRICAL AUTOLUBRICATED GAS BEARING

Edgar B. Romberg, Whittier, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 3, 1964, Ser. No. 394,200
Int. Cl.³ F16C *7/04, 35/00*
U.S. Cl. 308—9 **8 Claims**

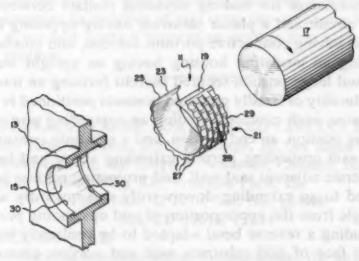


5. In an hydrodynamic gas bearing, a shaft member, a bearing member, said shaft member comprising a plurality of cylindrical bearing surfaces at least two of which are eccentrically mounted with respect to each other.

4,222,618
COMPLIANT HYDRODYNAMIC FLUID BEARING WITH RESILIENT SUPPORT MATRIX

William H. Miller, Jr., Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,262
Int. Cl.³ F16C *17/12, 32/06*
U.S. Cl. 308—9 **11 Claims**



1. A compliant hydrodynamic fluid bearing, comprising:

a bearing sleeve having a cylindrical bore formed therein;

a rotatable shaft received within said cylindrical bore and defining a gap between such shaft and said bore;

a bearing assembly received within said gap, including a resilient supporting element and a bearing sheet;

said bearing sheet being connected at one end thereof to one end of said supporting element, and having a bearing surface facing said shaft;

said supporting element operatively supporting said bearing sheet in said bore, said supporting element including at least three longitudinal strips disposed side-by-side and having formed therein a pattern of resilient projections, the pattern in adjacent strips being offset so that projections on portions of one strip lie intermediate the projections on adjacent portions of the adjacent strips on either side;

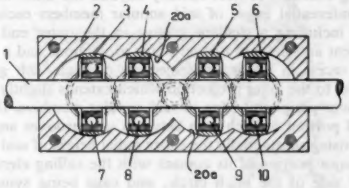
whereby said supporting element uniformly supports said bearing sheet upon a matrix of support zones distributed in a pattern across said bearing sheet to minimize local deflections of said bearing sheet, so that a large area, high pressure supporting hydrodynamic fluid film will be generated by relative rotation of said shaft and said bearing sheet.

11. An improved compliant bearing of the type wherein a first bearing element, providing a bearing surface, is disposed in juxtaposition with and connected at one position to a second bearing element having surface elevations which are operative to resiliently support said first bearing element, wherein the improved comprises: an arrangement of said surface elevations of said second bearing element disposed in a checkered pattern of resilient elevations aligned in one direction and staggered in an orthogonal direction so that said second bearing element resiliently supports said first bearing element on a matrix of support zones providing a good approximation of continuous support.

4,222,619
DEVICE FOR TRANSFORMING A ROTATIONAL MOVEMENT INTO A LINEAR MOVEMENT

Sven W. Nilsson, Partille, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Continuation of Ser. No. 817,148, Jul. 20, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,043
Claims priority, application Sweden, Sep. 6, 1976, 7609795
Int. Cl.³ F16H *21/16;* **F16C** *19/04*
U.S. Cl. 308—176 **6 Claims**



1. In a device for transforming a rotational movement into a linear movement comprising a shaft, a retainer circumscribing the shaft and moveable axially thereof, a plurality of annular bearing members encircling the shaft and each having a surface portion confronting and engaging the peripheral surface of the shaft at axially spaced locations, a housing for each bearing member tiltable about a predetermined tilting axis, each annular bearing member rotatable about its own axis, enclosing said shaft and supported in a respective housing, means mounting the housings in the retainer including means for tilting the housings and annular bearing members relative to the shaft, the improvement comprising means defining external surface sections formed integrally with each housing defined by circular arcs having their centers located on the tilting axis of the housing, said surface sections slidingly engaging interior retainer walls of complementary form.

4,222,620
CAGE FOR A ROLLING BEARING MADE OF SYNTHETIC MATERIAL

Knut Mirring, Gochsheim, Fed. Rep. of Germany, assignor to SKF Industries, Inc., King of Prussia, Pa.

Continuation of Ser. No. 801,298, May 27, 1977, abandoned. This application Jan. 30, 1979, Ser. No. 7,784
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 7625839[U]
Int. Cl.³ F16C *19/20, 33/46*
U.S. Cl. 308—217 **2 Claims**

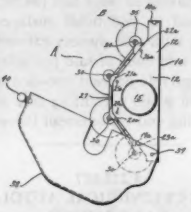
1. A one-piece cage for a rolling bearing assembly made of an elastically deformable synthetic material comprising a pair of spaced annular members of a predetermined uniform radial height having an inner peripheral edge, a plurality of axially extending webs between said annular members and being of a maximum radial dimension only slightly greater than the radial height of said annular members, said webs being circumferentially spaced to define a plurality of pockets for rolling elements, the webs having arcuate confronting faces conforming generally to the contour of the rolling elements, each web having inner and outer projections adjacent inner and outer end portions thereof spaced apart a distance less than the diameter of the rolling elements to retain the rolling elements in the pockets and being flexible to permit assembly of the rolling elements in the pockets from either radial direction, the side edges of the inner projection of each web tapering inwardly, the pitch circle of the rolling elements lying in a circular plane disposed approximately midway of the radial height of said annular members whereby only a small portion of the rolling elements project radially beyond the inner and outer circumferential edges of said annular members each of said webs including a shallow groove in the outer end portion adjacent and inboard of said outer projections and a shallow axial recess in the inner projection of each web generally parallel to the inner projection which extends slightly beyond the inner peripheral edge of said annular members, the unrelieved portion of each web between said grooves and recess comprising substantially the entire radial height of said web for the major portion of its contact with the rolling elements on either side of the pitch circle, said cage being symmetrical relative to a plane transverse to the axis of the cage passing midway of said webs.

4,222,621
DEVICE FOR STORING AND DISPENSING TISSUES, TOWELS, AND THE LIKE THAT ARE PROVIDED IN THE FORM OF ROLLS

Lois J. Greenlee, and Lyman R. Greenlee, both of 1105 LaSalle, Belleville, Ill. 62221

Filed Jul. 11, 1979, Ser. No. 56,722
Int. Cl.³ B65H *19/04, 49/00*
U.S. Cl. 312—37 **8 Claims**

1. A device for storing and dispensing goods which are wound on rolls comprising:
(a) a frame;
(b) a rod supported on the frame, said rod being capable of revolving;
(c) a first drive wheel mounted on said rod;
(d) a second drive wheel mounted on said rod;
(e) a first set of rollers lying in the same plane as the first drive wheel;
(f) means for mounting said first set of rollers in the frame;
(g) a second set of rollers lying in the same plane as the second drive wheel;

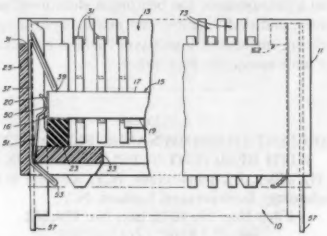


(h) means for mounting said second set of rollers in the frame;
(i) a first belt which loops around the first drive wheel and first set of rollers;
(j) a second belt which loops around the second drive wheel and second set of rollers;
(k) a plurality of core holders mounted on said belt to hold the rolls to be stored.

4,222,622
ELECTRICAL CONNECTOR FOR CIRCUIT BOARD

Wendell L. Griffin, Warren, and John E. Benasutti, Oil City, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 12, 1978, Ser. No. 914,641
Int. Cl.³ H05K *1/12*
U.S. Cl. 339—17 CF **1 Claim**



1. A connector for making electrical contact between an external circuit and a planar substrate having opposing faces with sides having conductive portions thereon, said conductor comprising an insulating housing having an upright walled section and ledge portion secured thereto forming an interior area, a plurality of fixedly mounted contacts positioned in said interior area, each contact including an upstanding portion, a projecting portion, an end portion, and a substrate contacting portion, said upstanding portion extending above and below said substrate adjacent said wall, said projecting portion being connected to an extending downwardly and inwardly at an acute angle from the upper portion of said upstanding portion and including a reverse bend adapted to be resiliently biased over one face of said substrate, said end portion extending inwardly and downwardly from the lower portion of said upstanding portion and projecting below a plane of the walled section whereby said contact is adapted to generate compressive forces when electrical contact is made with an external circuit, said substrate contacting portion extending upwardly

adjacent said upstanding portion and being resiliently biased inwardly for yieldably contacting the conductive portions on the sides of the substrate, and means for resiliently supporting the other face of said substrate.

4,222,623

GLOW-LAMP HOLDER

Tore Hultberg, Hulie, S-340 14 Lagan, Sweden

Filed Jul. 26, 1978, Ser. No. 927,986
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—34 **6 Claims**

1. In a lamp holder containing an automatic switch mechanism having, on the face thereof facing the lamp, contacts for providing electrical contact with the contact surfaces of the base of the lamp and having terminals for connection to the conductors supplying current to the lamp, said switch mechanism operating automatically to interrupt the electrical connection between said terminals and said contacts in response to removal of said lamp from said holder and to close said electrical connection in response to insertion of said lamp into said lamp holder, the improvement wherein:

said switch mechanism comprising a main portion which is stationarily mounted in said lamp holder and on which said terminals are mounted, and a contact supporting portion on which said contacts are mounted;

said contact supporting portion being movable relative to said main portion between a working position in which electrical connection is made between said terminals and said contacts and an ineffective position in which said connection is interrupted;

means holding said contact supporting portion in said ineffective position when said lamp is removed; and

means secured to said contact supporting portion and responsive to insertion of said lamp into said lamp holder to move said contact supporting portion into said working position.

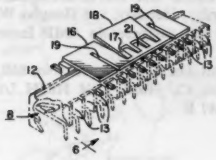
4,222,624

INTERFACE WAFER FOR PRINTED CIRCUIT BOARD

Robert Eme, deceased, late of Chicago, Ill. (by Elain M. Eme, administratrix), and Lloyd P. Schuman, Chicago, Ill., assignors to Midway Mfg. Co., Franklin Park, Ill.

Filed Mar. 2, 1979, Ser. No. 16,886
Int. Cl.[3] H01R *13/54*
U.S. Cl. 339—91 R **1 Claim**

1. A locking interface wafter for preventing the physical and electrical separation of a connector means and a printed circuit board, said interface wafer comprising a body section, an engaging member attached to said body section by a first supported side with a second unsupported side extending out from said body section, at least one conductor means anchored in said body section and being electrically connectable to said connector means on a first end and to an electronic component on an opposing end, said engaging means including a flexible portion for quickly and efficiently disengaging and positively locking said interface wafer to said connector means, said flexible portion being defined by slots on said engaging member extending from a point proximate to said body section and opening onto said second unsupported side, said slots allowing limited angular motion of said flexible portion out of the plane of said engaging member, said flexible portion having an inclined lever arm extending at an acute angle above said spaced members, said inclined lever arm being secured to said flexible portion by a plurality of angled braces, said inclined lever arm having an elevated end portion for manual depression by a user, a projection on a side of said flexible portion opposite said inclined lever arm, a ledge on said connector means, said ledge being releasably mateable with said projection in a positive locking action, said projection being easily disengageable with said ledge on the depression of said inclined lever arm to cause said projection to rise over said ledge and allow said connector means to be easily withdrawn from engagement with said interface wafer.

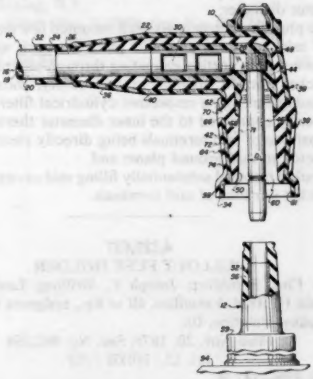


4,222,625

HIGH VOLTAGE ELECTRICAL CONNECTOR SHIELD CONSTRUCTION

Anthony Reed, Port Murray, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,084
Int. Cl.[3] H01R *13/52, 15/06*
U.S. Cl. 339—143 C **17 Claims**



1. In a shielding system for an electrical connector having a housing including a first end for engagement with a high voltage electrical cable and a second end carrying an electrical contact element for connection with a high voltage terminal, the improvement comprising:

a shield extending along the housing, the shield being electri-

cally separated from the electrical contact element and including a first portion adjacent the first end of the housing and a second portion adjacent the second end of the housing;

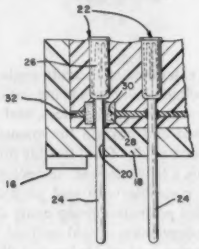
the second portion of the shield being electrically separated from the first portion such that the electrical potential difference between the contact element and the second portion of the shield, under energized conditions, will be less than the electrical potential difference between the contact element and the first portion of the shield.

4,222,626

FILTERED DIP HEADER ASSEMBLY

Robert D. Hollyday, Hershey, and Douglas W. Glover, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 16, 1978, Ser. No. 869,874
Int. Cl.[3] H05K *1/04*; H03H *7/00*
U.S. Cl. 339—147 R **3 Claims**



1. A filtered dip header assembly comprising:

a unitary housing of insulating material having an base, spaced sidewalls and endwalls defining a single elongated cavity therebetween;

a plurality of terminal passages in said base in a patterned array;

a conductive ground plane positioned in said cavity spaced from said base and having therein a like plurality of apertures, each said aperture being aligned with a respective passage in said base;

a cylindrical filter mounted in at least one of said apertures and electrically connected to said ground plane by its outer diameter;

a like plurality of terminals each mounted in a respective one of said apertures and said passages, each said terminal having a pin portion extending through said passage and a socket portion opening in said cavity, those terminals passing through a respective cylindrical filter being electrically connected to the inner diameter thereof;

at least one of said terminals being directly electrically connected to said ground plane; and

insulation material substantially filling said cavity around the socket portions of said terminals.

4,222,627

PULLOUT FUSE HOLDER

Russell Cox, Frankfort; Joseph C. Drilling, Lexington, and Ronald H. Reed, Versailles, all of Ky., assignors to Square D Company, Palatine, Ill.

Filed Nov. 20, 1978, Ser. No. 962,354
Int. Cl.[2] H01R *7/02*
U.S. Cl. 339—147 R **6 Claims**

1. A pullout fuse holder comprising:

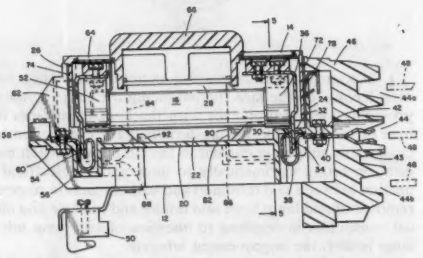
a housing of insulating material having a first perimeter wall including a pair of spaced apart first side walls and a pair of spaced apart first and end walls defining a recess boundary,

a plurality of pairs of spaced apart first housing terminals with one terminal of each pair carried by said housing adjacent a respective portion of a respective end wall of said first perimeter wall, one terminal of each pair spaced a respective predetermined distance apart from the other terminal of the respective pair,

cover wall means of insulating material having a rim portion overlapping said first perimeter wall and including means for carrying a respective fuse for each pair of terminals at spaced positions,

said cover wall means including a second perimeter wall having a pair of spaced apart second side walls and a pair of spaced apart second end walls spaced for nesting receipt in said recess boundary with each of said second side walls engaging one of said first side walls and each of said second end walls engaging one of said first end walls of said first perimeter wall in response to the alignment of each pair of cover walls with a respective pair of housing walls and the movement of said cover walls along a common axis with said housing walls into said recess,

a pair of cover terminals corresponding to each pair of housing terminals to interconnect a respective pair of housing terminals with a respective fuse, each terminal of a respective pair of cover terminals spaced a respective predetermined distance apart from the other terminal of the respective pair of cover terminals and carried by said cover wall means adjacent a respective second end wall of said cover wall means for engagement with a respective one terminal of a respective one pair of housing terminals in response to the alignment of said second side walls and



second end walls of said cover means in one orientation relative said first side walls and said first end walls of said housing to align each cover terminal with a respective one terminal of a respective one pair of housing terminals and the movement of said cover means along said common axis to engage each cover terminal with a respective one housing terminal and a respective one of said second side walls and said second end walls with a respective one of said first side walls and said first end walls in said recess with said rim portion of said cover wall means overlappingly engaged with said first perimeter wall,

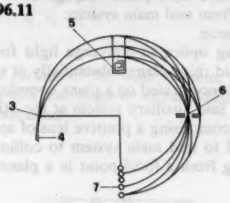
first stop means carried by said cover wall means in spaced positions,

and other stop means in said housing recess at respective spaced positions engaging said first stop means in said recess for preventing engagement of any one of said cover terminals with any one of said first housing terminals in response to another orientation of said cover wall at 180° to said one orientation aligning each cover terminal with a housing terminal different than the respective one terminal and movement of said cover wall means along said axis to engage said second side walls and said second end walls of said cover wall means with the respective other first side wall and respective other first end wall and in said recess whereby said cover wall means is supported against inadvertent movement by said stop means and the engaged side and end walls with said rim portion spaced from said first perimeter wall.

4,222,628
OPTICAL THIN FILM PROCESSOR FOR UNIDIMENSIONAL SIGNALS

Giancarlo Righini; Vera Russo, and Stefano Sottini, all of Florence, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Aug. 1, 1978, Ser. No. 930,062
Claims priority, application Italy, Aug. 1, 1977, 9534 A/77
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.11 7 Claims

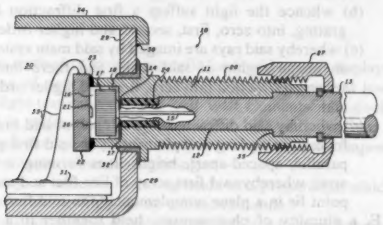


1. An optical thin film device for the processor for unidimensional signals comprising, a thin film of dielectric material transparent to laser radiation and shaped as a spherical lune having an angle of 270°, said thin film supported by a spherical substrate formed of material having a refractive index less than that of the thin film, a point source located on either meridian delimiting said thin film, detecting means located on the other meridian delimiting the thin layer, a modulator located on the meridian lying at 90° with respect to the input meridian, and a device located on the meridian lying at 180° with respect to the input meridian for the spatial-filtering of a signal coming from the modulator lying on the meridian at 90°.

4,222,629
FIBER OPTIC CONNECTOR ASSEMBLY

Michael A. Dassele, Scottsdale; Stephen T. Kush, and Don E. Mitchell, both of Phoenix, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,168
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.20 6 Claims



1. A connector assembly for use in a fiber optic transmission system comprising:

a connector body having in substantially coaxial relationship, a first internal bore for receiving a fiber optic plug, a second internal bore, and means defining an aperture therebetween;

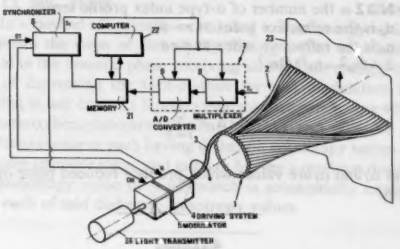
a faceplate of optically transparent material secured in said second bore with a first surface thereof adjacent to said aperture; and constructed to transmit diverging light beams incident thereto with no additional beam divergence and

electro-optic converter means fixedly positioned to said connector body adjacent to a second surface of said faceplate and in substantially coaxial relationship with said first and second bores and said aperture.

4,222,630
DIGITALLY CONTROLLED FIBER OPTIC RECORDING DEVICE

Robert Delignieres, Mareil-Maily, France, assignor to Institut Francias du Petrole, Rueil-Malmaison, France

Filed Aug. 2, 1978, Ser. No. 930,480
Claims priority, application France, Aug. 3, 1977, 77 24152
Int. Cl.[2] G02B 5/16; G01D 9/00
U.S. Cl. 350—96.24 9 Claims

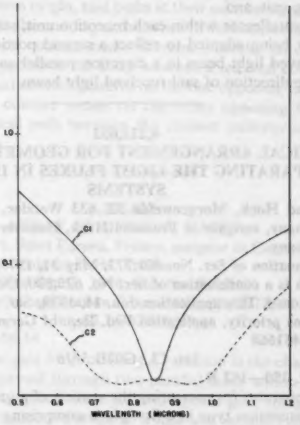


1. A device for recording data on a photosensitive recording support, comprising an optical member adapted to transmit a light beam of variable intensity and fixed direction, means for modulating said light beam, a fiber optic transducing system and means for sequentially transmitting the light beam to the optic fibers of the transducing system at one of their ends, the other ends of said optic fibers being so located that the light transmitted through each fiber impinges on said photosensitive recording support, said device further comprising means for incremental displacement of the recording support relative to the transducing system, and digital monitoring means for modulating the length of time that each optic fiber is illuminated by the light beam issued from said modulation means in proportion to the value of the datum being recorded, and for controlling the transmission means and the displacement means.

4,222,631
MULTICOMPONENT OPTICAL WAVEGUIDE HAVING INDEX GRADIENT

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,214
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.31 11 Claims



1. An optical waveguide comprising at least three glass-

forming compounds and having a core with a radially-graded refractive index profile and a cladding, said refractive index profile changing as a function of radius r substantially as:

$$n^2(r) = n_c^2\left[1 - \sum_{(i=1)}^{N} 2\Delta_i(r/a)^{\alpha i}\right]$$

where

$N \geqq 2$ is the number of α-type index profile terms

n_c is the refractive index at $r=o$

n_o is the refractive index at $r=a$

$\Delta=(n_c^2-n_o^2)/2n_c^2$

$$\Delta = \sum_{i=1}^{N} \Delta_i$$

and Δ_i and α_i are values which produce reduced pulse dispersion.

4,222,632

LIGHT RECEIVING AND REFLECTING DEVICE

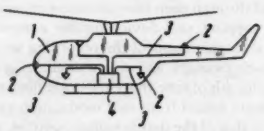
Kurt Eichweber, Holsteiner, Chaussee 379/381, 2000 Hamburg 61, Fed. Rep. of Germany

Filed Oct. 17, 1978, Ser. No. 952,235

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746800

Int. Cl.³ H04B 9/00

U.S. Cl. 350—102 **7 Claims**



1. A device for receiving and detecting a light beam, comprising:

reception units for receiving said light beam, said reception units mounted at spatially distributed locations over the surface of a practice target;

a central processing unit for analyzing a first portion of said received light beam;

an optical conductor disposed between each reception unit and said central processing unit for transmitting said first portion of said received light beam to said central processing unit; and

a retroreflector within each reception unit, said retroreflector being adapted to reflect a second portion of said received light beam in a direction parallel and opposite to the direction of said received light beam.

4,222,633

OPTICAL ARRANGEMENT FOR GEOMETRICALLY SEPARATING THE LIGHT FLUXES IN IMAGING SYSTEMS

Fromund Hock, Morgenweide 32, 633 Wetzlar, Fed. Rep. of Germany, assignor to Fromund Hock, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 801,777, May 31, 1977, abandoned, which is a continuation of Ser. No. 625,890, Oct. 28, 1975, abandoned. This application Jun. 14, 1978, Ser. No. 915,320

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1974, 2451668

Int. Cl.³ G02B 5/18

U.S. Cl. 350—162 R **5 Claims**

1. Apparatus for measuring the motion of a grating scale of the transmission type in a first plane comprising:

A. a main imaging system having an optical axis normal to said plane and to said scale which images said scale on itself, in that points on said scale at one side of said axis are imaged at the conjugate points in said plane and on said scale at the other side of said axis, said system defining a second plane complementary to said first plane,

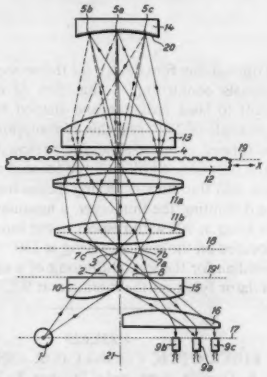
said main system at one side of said first plane comprising a mirror substantially normal to said axis; and

a refracting element between said mirror and said scale;

B. an auxiliary imaging system to image the points of said first plane in a third plane conjugated to said first plane and apart from said main system;

C. a light source;

D. condensing optics to converge light from said source through said third plane substantially at one side of said axis to be concentrated on a plane complementary to said first plane, said auxiliary system at the other side of said first plane comprising a positive lens of aperture substantially equal to said main system to collimate light upon said grating from a focal point in a plane conjugated to



said first plane, said light source and said condensing optics converging the illumination on said focal point;

(a) whereby said converged light is collimated to illuminate an object region of said scale at one side of said axis;

(b) whence the light suffers a first diffraction by said grating, into zero, first, second and higher order rays;

(c) whereby said rays are imaged by said main system onto an image region of said scale, and there undergo a second diffraction into zero, first and higher order rays; and

(d) whereby said diffracted rays of each of said orders are focused in a plane complementary to said first plane as parallel, spaced-apart, bright lines forming a regular array whereby said first array of line foci and said focal point lie in a plane complementary to said first plane;

E. a plurality of photosensors, held together in a second array; and

F. means for imaging said first array on said second array.

4,222,634

WIDE ANGLE OBJECTIVE FOR EXAMINATION OF THE EYE

Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,691

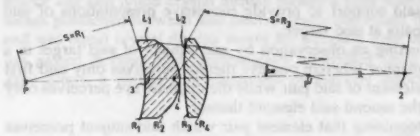
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716616

Int. Cl.² G02B 3/04, 9/00; A61B 3/14

U.S. Cl. 350—189 **6 Claims**

1. A wide angle objective for visual and photographic examination of the fundus of the eye, comprising a plurality of lens elements collectively forming the objective, each element

being formed with one surface which provides mainly the refractive power of the element and an opposite surface which is substantially concentric with a pupil locus produced by the



first mentioned surface of the same element, said pupil locus being the locus of a real image or virtual image of the pupil of an eye being examined.

4,222,635

METHOD AND APPARATUS FOR PRODUCING LIQUID CRYSTAL DISPLAYS, AND A LIQUID CRYSTAL DISPLAY PRODUCED THEREBY

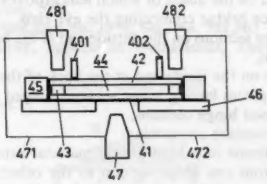
Elias Jülke, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 11, 1978, Ser. No. 868,697

Claims priority, application Switzerland, Jan. 28, 1977, 1058/77

Int. Cl.[2] G02F 1/13

U.S. Cl. 350—320 **2 Claims**



1. In a method of producing cells for liquid crystal displays, consisting of two planar cell wall elements of which at least one is light-transmissive, said cell wall elements adhesively bonded in order to form between said cell wall elements a planar cell cavity suitable for receiving liquid crystal compositions, the improvement comprising:

selecting an adhesive bonding made of a preparation which can be irreversibly set by actinic radiation,

applying an adhesive web made of said adhesive bonding made of said preparation to at least one of said cell wall elements, said adhesion web applied to a thickness greater than a predetermined value for the thickness of said planar cell cavity,

pushing said cell wall elements against one another,

measuring continuously using optical measuring means the distance between said cell wall elements as said cell wall elements are pushed against one another, and

polymerizing abruptly said adhesive bonding by exposing said bonding to actinic radiation when the measured value of thickness of said cell cavity equals said predetermined value of thickness, said polymerization resulting in practically no further reduction of said thickness of said cell cavity upon further pushing of said cell wall elements against one another.

4,222,636

LIQUID CRYSTAL MIXTURE AND ITS APPLICATION TO OPTICAL MODULATION

Georges Assouline; Michel Hareng, and Eugene Leiba, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 564,822, Apr. 2, 1975, abandoned, and a continuation of Ser. No. 403,561, Oct. 4, 1973, abandoned. This application Mar. 17, 1978, Ser. No. 887,737

Claims priority, application France, Oct. 10, 1972, 72.35854

Int. Cl.[2] G02F 1/13

U.S. Cl. 350—350 R **3 Claims**

1. In a method of optically modulating radiant energy which comprises the steps of electrically biasing a film of a liquid crystal in the nematic phase receiving said radiant energy; the step of decreasing the turn-on-time for said modulation by utilizing as said crystal a liquid crystal mixture comprising 40% of methoxybenzylidenebutylaniline(MBBA) and 60% of p-butylazoxybenzene each having dielectric anisotropy values of mutually opposite signs; said mixture having a resultant dielectric anisotropy value of +0.2 which is substantially smaller than each of said dielectric anisotropy values.

4,222,637

ELECTRIC OPTIC SWITCH

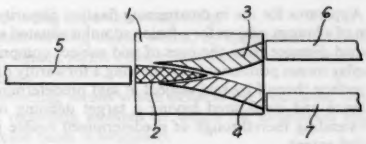
John S. Heeks, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,551

Claims priority, application United Kingdom, Mar. 31, 1977, 13600/77

Int. Cl.[2] G02F 1/29

U.S. Cl. 350—356 **7 Claims**



1. An electric-optic switch, comprising: a body of electro-optic material, said body having at least two plane opposing faces and two plane end faces normal to said opposing faces, at least one of said opposing faces being provided with a number of electrical contact patterns which in selected combinations combine to define at least two tangentially divergent paths having a common origin, said paths at their ends being substantially normal to the end faces, the other of said opposing faces having electrical contact means thereon whereby an electric field may be applied to the body between a selected combination of electrical contact patterns on the one opposing face and the electrical contact means on the other opposing face to define an optical path between the contact patterns and the contact means.

4,222,638

ARRAY OF OPTICAL GATES

Jacques Robert, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 8, 1978, Ser. No. 940,840

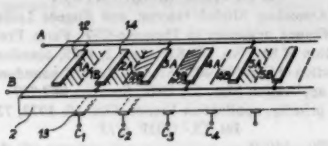
Claims priority, application France, Sep. 19, 1977, 77 28175

Int. Cl.[3] G02B 5/14

U.S. Cl. 350—96.14 **8 Claims**

1. An optical gate for producing a variation in the characteristics of light passed through two parallel faces which limit a plate of electro-optical material, said optical gate comprising: at least two conductive strips of a first and second type, said strips being placed on opposite faces of the plate and connected

to two different voltage sources, said two strips being so arranged that the plane which passes through their axes is inclined with respect to the direction of the light, said plate being a PLZT ceramic material.

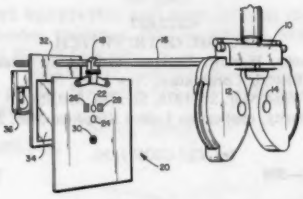


4,222,639

APPARATUS AND SYSTEM FOR ANALYZING FIXATION DISPARITY

James E. Sheedy, 126 Aldrich Rd., Columbus, Ohio 43214

Filed Oct. 31, 1978, Ser. No. 956,403
Int. Cl.³ A61B *3/08*
U.S. Cl. 351—4 **10 Claims**



1. Apparatus for use in determining fixation disparity in the vision of a human subject for a fusion stimulus situated a predetermined distance from the eyes of said subject comprising:

display means positionable for viewing a forwardly disposed surface thereof by said subject at said predetermined distance and configured having a target defining opening extending therethrough of predetermined fusible peripheral extent;

target element carrier means mounted for movement upon said display means opposite said forwardly disposed surface thereof, formed of thin sheet material and configured to carry a sequence of pairs of discrete linear first and second target elements mutually spaced a fixed predetermined distance from each other along the parallel lengthwise extent thereof, said sequence commencing with a first pair of said elements arranged in end-to-end relationship and successive said element pairs being spaced apart transversely to said lengthwise parallel extent by predetermined incrementally increasing amounts, each said transverse spacing corresponding with the angular subtense of said spaced first and second elements witnessed at the eyes of said subject for said predetermined distance; and

means for illuminating said target in a manner wherein one eye of said subject perceives only said first element of a said pair when within said opening while the opposite eye perceives only the second said element of said pair.

7. The method for measuring fixation disparity in a human subject comprising the steps of:

positioning said subject in a manner wherein the eyes thereof are spaced a predetermined distance from a target dimensioned to represent a fusion stimulus to said subject;

displaying as a portion of said target a sequence of paired, first and second discrete, linear parallel target elements carried upon a support, mutually spaced a fixed predetermined distance from each other along the parallel lengthwise extent thereof, said sequence commencing with a first pair of said first and second elements mutually arranged in parallel end-to-end relationship and successive said element pairs fixed upon said support being spaced apart transversely to said lengthwise parallel extent by predetermined incrementally increasing amounts, each said transverse spacing corresponding with the angular subtense of said spaced elements witnessed at said subject eyes, said sequential display being carried out by moving said support to provide successive presentations of said pairs at said target;

effecting an observation by said subject of said target in a manner wherein one eye thereof perceives only said first element of said pair while the opposite eye perceives only the second said element thereof;

determining that element pair which said subject perceives at said target as being aligned in parallel, end-to-end relationship;

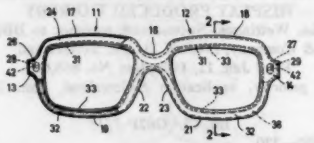
indicating the value of said angular subtense corresponding with said transverse spacing of said element pair perceived as being aligned in parallel, end-to-end relationship, said angle representing fixation disparity.

4,222,640

SAFETY SPECTACLES

Walter H. Bononi, Zeppelinstrasse 9, 7012 Fellbach-Schmiden, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,778
Int. Cl.³ G02C *1/00, 3/00, 5/14;* A61F *9/02*
U.S. Cl. 351—83 **10 Claims**



1. In safety spectacles comprising two eye rims having end portions and on the inside of which lens grooves are provided,

a one-piece bridge connecting the eye rims,

fixed hinge sections on the outside and at the back of the end portions,

nose pads on the inside and at the back of the eye rims,

two side pieces having hinge sections hinged to the above-mentioned hinge sections,

the improvement comprising:

an inner frame of a hard plastic material extending in one piece from one hinge section to the other, through the upper parts of the eye rims and the bridge,

said inner frame having a surface of natural roughness whereby a foam covering will securely adhere thereto,

the base plates of the hinge sections being embedded in the inner frame, and

a fine-celled polyurethane foam shape-defining exterior shell covering the inner frame several millimeters thick, determining the contour and shape of the spectacles independently of the inner frame,

the inner frame not dictating the shape of the exterior shell and not emerging anywhere except at the lens grooves,

the polyurethane foam being homergenous, soft and elastic and forming and defining deflectable nose pads without internal stiffening members.

4,222,641

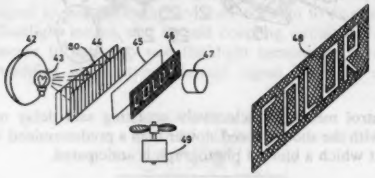
IMAGE OR PICTURE PROJECTING SYSTEM USING ELECTRONICALLY CONTROLLED SLIDES

Michael Stolov, 25 Hapoel St., Nof-Yam, Herzlia, Israel

Filed Sep. 20, 1978, Ser. No. 943,982
Claims priority, application Israel, Jun. 29, 1978, 55032
Int. Cl.³ G03B *21/00, 21/14*
U.S. Cl. 353—84 **20 Claims**

1. A changeable image or picture system for producing complex, colored, intensity-variable images or pictures comprising a light source; liquid crystal display means for display-

ing images or pictures; at least one electronically controlled liquid crystal color filter and at least one electronically controlled liquid crystal gray filter, positioned between said light source and said liquid crystal display means; a light scattering means positioned between said electronically controlled filters and said liquid crystal display means for diffusing light which has passed through said electronically controlled color and gray filters; a plurality of electrodes operatively associated



with said liquid crystal display means; means for supplying selectively to individual ones of said electrodes associated with said liquid crystal display means voltages to make selected portions or said liquid crystal display means transparent; a screen; and lens means for projecting light passing through said liquid crystal display means onto said screen; whereby colored, intensity-variable complex images or pictures appear on the screen.

4,222,642

EXPOSURE DEVICE FOR THE MANUFACTURE OF CATHODE-RAY TUBES FOR DISPLAYING COLORED PICTURES AND CATHODE-RAY TUBE MANUFACTURED BY MEANS OF SUCH A DEVICE

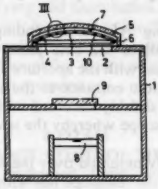
Johannes C. A. van Nes, and Herman F. van Heek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,367

Claims priority, application Netherlands, Dec. 31, 1975, 7515224

Int. Cl.³ G03B *41/00*

U.S. Cl. 354—1 **3 Claims**



1. In an exposure device for the manufacture of colour cathode-ray tubes having a colour selection electrode and display screen which comprises an elongate light source, extending parallel to the elongate apertures in the colour selection electrode, for exposing photosensitive material on the screen, means for controlling the emission of light from said source and a correction lens or lens system between the light source and the colour selection electrode; the improvement wherein said means comprises a diaphragm provided with a large number of slot-like apertures positioned at a distance of approximately 1 mm from each other in the longitudinal direction of the light source, said apertures extending substantially at right angles to the longitudinal direction of the light source and the width of said slot-like apertures increasing linearly from 0.1 mm at the ends of the diaphragm to 1 mm in the centre of the diaphragm for controlling the amount of light emitted per unit length by the light source to decrease substantially linearly from a maximum at the effective centre to substantially zero at the effective ends of the light source so that a triangular light profile is obtained.

4,222,643

RECORDING POSITION ADJUSTER

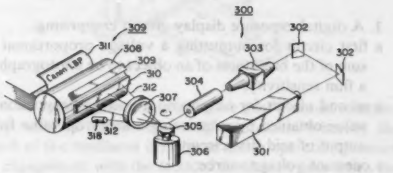
Takashi Kitamura, Yokohama; Asao Watanabe, Higashikurume; Takashi Nakano, Yokohama; Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Taisuke Tokiwa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 616,675, Sep. 25, 1975, Pat. No. 4,059,833. This application Sep. 9, 1977, Ser. No. 831,920

Claims priority, application Japan, Feb. 3, 1975, 50-14544; Feb. 4, 1975, 50-14530; Feb. 4, 1975, 50-14534; Feb. 13, 1975, 50-18528; Mar. 1, 1975, 50-25120

Int. Cl.² G03B *15/00*

U.S. Cl. 354—7 **33 Claims**



1. A printing apparatus comprising:

(a) beam forming means which, by application of character dot signals, forms a beam modulated by the character dot signals;

(b) deflecting means which deflects the modulated beam;

(c) a recording medium on which the modulated and deflected beam is irradiated;

(d) dot signal forming means which, by application of character signals, scanning line instructing signals and character size signals forms character dot signals corresponding to the character signals and the character size signals, and belonging to the instructed scanning lines;

(e) memory means having a plurality of unit memory regions for storing a plurality of character signals corresponding to characters to be recorded on said recording medium and character size signals indicating the size of the characters to be recorded;

(f) character size converting means which converts character size signals read from said memory means to converted character size signals indicating a different character size;

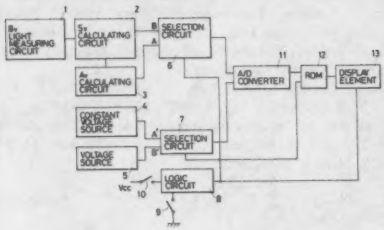
(g) instructing means which instructs whether the character signals stored in said memory means are to be utilized for recording on said recording medium in a first mode or in a second mode; and

(h) control means which, when said instructing means instructs recording in the first mode, reads out the character signals and the character size signals from one of said unit memory regions in said memory means and applies the read-out signals to said dot signal forming means, and which, when said instructing means instructs recording in the second mode, reads out the character signals and the character size signals from a plurality of said unit memory regions, drives said character size converting means to obtain simultaneously converted character size signals from the character size signals read-out from said plurality of unit memory regions and applies the read-out character signals and the converted character size signals to said dot signal forming means.

4,222,644
DIGITAL EXPOSURE DISPLAY CIRCUIT

Eiichi Tano, Asaka, and Masahiro Kawasaki, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 878,104
Claims priority, application Japan, Mar. 2, 1977, 52-22363
Int. Cl.[3] G03B *17/18*
U.S. Cl. 354—23 D **7 Claims**



1. A digital exposure display circuit comprising:

a first circuit for outputting a voltage proportional to the sum of the brightness of an object to be photographed and a film sensitivity;

a second circuit for outputting a voltage proportional to a value obtained by subtracting a lens stop value from the output of said first circuit;

a constant voltage source;

a voltage source for providing a voltage corresponding to a manually set shutter speed;

selecting means for selecting the outputs of said second circuit and said constant voltage source in a lens stop priority photographing system in which a lens stop is manually set and a shutter speed is automatically set, for selecting outputs of said first circuit and said voltage source in a shutter speed priority photographing system in which a shutter speed is manually set and a lens stop is automatically set, and for selecting the outputs of said second circuit and said voltage source in a manual photographing system in which both a shutter speed and a lens stop are manually set,

an analog-to-digital converter circuit for converting the difference between the selected analog voltages applied thereto by said selecting means into digital data, and

display means connected to said analog-to-digital converter for displaying said digital data.

4,222,645
CAMERA SHUTTER RELEASE DEVICE

Toshinori Imura, Sakai, and Harumi Tanaka, Kobe, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

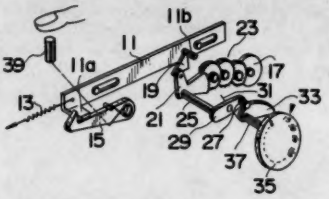
Filed Apr. 7, 1978, Ser. No. 894,393
Claims priority, application Japan, Apr. 21, 1977, 52-46485
Int. Cl.[3] G03B *7/08, 17/40*
U.S. Cl. 354—51 **15 Claims**

1. A shutter release device for cameras comprising:

manually operable means for actuating the shutter release device;

means for initiating shutter opening in response to the operation of said manually operable means;

delay means for controlling said initiating means to cause the initiation of the shutter opening after lapse of a delay time sufficient to enable movement of the camera to be stabilized subsequent to the operation of said manually operable means to prevent a blurred photograph induced by camera movement; and

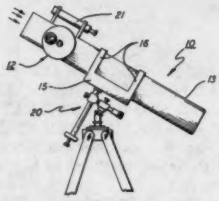


control means for selectively actuating said delay means with the shutter speed slower than a predetermined value at which a blurred photograph is anticipated.

4,222,646
PRIME FOCUS CAMERA FOR TELESCOPE

Robert D. West, 1031 Hanshaw Rd., Ithaca, N.Y. 14850

Filed May 31, 1979, Ser. No. 44,258
Int. Cl.[3] G02B *23/00;* **G03B** *17/48*
U.S. Cl. 354—79 **14 Claims**



1. A camera that is capable of being mounted within the focus mount tube of a telescope through which the telescopic image passes including

a base plate having a clear aperture passing vertically therethrough,

a hollow mounting cylinder depending downwardly from the bottom wall of the base plate, said cylinder being co-axially aligned with the aperture and being arranged to enclose the bottom entrance to the aperture therein, said cylinder being slidably received within the focus mount tube of the telescope whereby the telescopic image passes therethrough,

a housing movably mounted over the base plate so that the image plane of the telescope lies within said housing, said housing containing at least one film-holding compartment for supporting film in the image plane of the telescope over an exposure passage that faces the base plate, and a viewing window passing vertically through the housing,

positioning means extending between the base plate and the housing to permit the housing to be selectively positioned upon the base plate to place either the viewing window or the film-holding compartment over the aperture whereby the telescopic image is presented therein.

4,222,647
ADAPTOR FOR AUTO STROBO UNIT

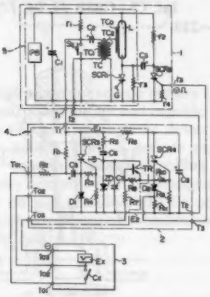
Osamu Kawarada, Fuchu; Takeshi Nakane, and Isao Kondo, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,259
Claims priority, application Japan, Dec. 26, 1977, 52-158281
Int. Cl.[3] G03B *15/05*
U.S. Cl. 354—145 **9 Claims**

1. An adaptor for use with a camera having (1) a synchro

contact and (2) means for providing an illumination interrupt signal; and an auto strobo unit having (1) flashlight means, (2) a flashlight trigger circuit for enabling said flashlight means, and (3) flashlight termination means for disabling said flashlight means, said adaptor comprising:

a first coupling circuit responsive to operation of said synchro contact for initiating operation of said flashlight trigger ciruit; and a second normally disabled coupling circuit enabled by the operation of said first coupling circuit and said illumination interrupt signal for coupling a signal to said flashlight termination means to disable said flashlight means, said second coupling circuit including means to apply to said flashlight termination means a modified illumination interrupt signal having a signal



strength and polarity which is sufficient to effectively disable said flashlight means whereby said adaptor renders said camera effective to operate said auto strobo unit.

7. For use with a camera having a synchro contact and means for generating an illumination interrupt signal and an auto strobo unit having a flashlight control circuit and a termination signal terminal, an adaptor comprising:

a trigger signal coupling circuit for enabling said flashlight control circuit of said auto strobo unit in response to the closure of the synchro contact of said camera, amplifier means for amplifying said illumination interrupt signal to a given level before it is applied to the illumination termination signal terminal of said strobo unit, and circuit means for enabling said amplifier means when the trigger signal coupling circuit is operated.

4,222,648

FILM ADVANCE CONTROL MECHANISM

Richard C. Beaver, Inglewood, Calif., assignor to American Electronics, Inc., Fullerton, Calif.

Filed Jul. 31, 1979, Ser. No. 62,543

Int. Cl.[3] G03B *1/18, 1/24, 41/00*

U.S. Cl. 354—171 **7 Claims**

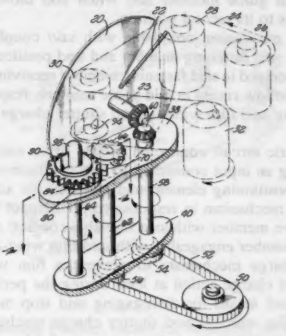
1. In a camera which includes a lens aperture, a shutter mechanism which has an open position and a closed position relative to the lens aperture, film transport means for moving a strip of film in frame by frame sequence past said lens aperture and including a film supply reel and a film driven reel, and means for continuously actuating said shutter mechanism between the closed position and the open position; a film advance control mechanism which comprises:

means coupled with said shutter actuating means for controling the movement of the film transport means whereby the film remains stationary at one frame position during the time the shutter is in the open position and moves to the next frame position during the time the shutter is in the closed position, including

a toothed driven gear connected to the film transport means and containing an enlarged space between adjacent gear teeth at at least one position on the periphery thereof of a size equivalent to the removal of one gear tooth;

a mutilated drive gear having a smooth peripheral portion and a tooth portion with an end gear tooth adjacent to said smooth portion;

said drive gear and said driven gear being positioned in close operative relationship whereby upon rotation of the drive gear, said end tooth and the one adjacent thereto can be received in the enlarged space on the driven gear;



means for rotating the mutilated drive gear in timed relationship with the shutter actuating mechanism whereby the teeth of the mutilated drive gear are in operative position in engagement with the teeth of the driven gear when the shutter is in the closed position, and the smooth peripheral portion of the drive gear is in said operative position when the shutter is in the open position; and

means for maintaining said driven gear immobile when the shutter is in the open position.

4,222,649

PHOTOGRAPHIC FILM WIND-UP AND SHUTTER CHARGE MECHANISM

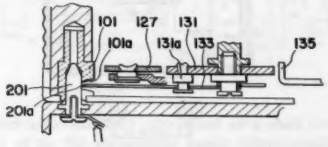
Masatake Niwa; Norihiro Inoue; Kunio Kawamura, all of Sakai, and Norio Beppu, Senman all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1978, Ser. No. 879,109

Claims priority, application Japan, Feb. 17, 1977, 52-16819; Feb. 28, 1977, 52-21675

Int. Cl.[2] G03B *1/18*

U.S. Cl. 354—173 **14 Claims**



1. A camera comprising a guide member having a hollow recess opening out of said guide member; fastening member receiving means; a film wind-up and shutter charge mechanism operable to feed a film past an exposure station subsequent to exposure of the film and having a coupling member; signal means having a movable contact movable in response to termination of exposure from a first position outside said hollow recess to a second position in said hollow recess subsequent to termination of exposure;

a camera drive unit having;

a fastening member receivable in said fastening member receiving means to fasten said drive unit onto said camera,

a single positioning element receivable in said hollow recess in said guide member when said fastening member is received in said fastening member receiving means for acting together with said fastening member for positioning said camera drive unit relative to said camera, said single positioning element having an electrically conductive member capable of contacting said movable contact when said positioning element is received in said hollow recess in said guide member and when said movable contact moves to its second position,

a drive mechanism couplable with said coupling member when said fastening member and said positioning element are received in said fastening member receiving means and said hollow recess in said guide member, respectively, for driving said film wind-up and shutter charge mechanism, and

an electric circuit connected to said drive mechanism and having an input connected to said conductive element of said positioning element and actuated for actuating said drive mechanism in response to the contact of said conductive member with said movable contact; and

a stop member engageable with said film wind-up and shutter charge mechanism to prevent a film wind-up and shutter charge action at least during the period of exposure and means for disengaging said stop member from said film wind-up and shutter charge mechanism subsequent to termination of exposure, and wherein said stop member is associated with said signal means for moving said movable contact from said first to said second position upon the disengagement of said stop member from said film wind-up and shutter charge mechanism.

4,222,650

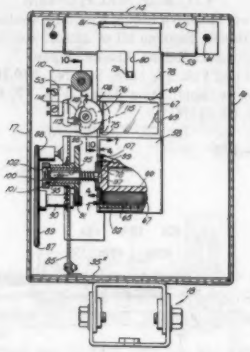
AUTOMATIC CAMERA

Norman R. Gunderson, Pasadena, Calif., assignor to American Electronics, Inc., Fullerton, Calif.

Filed Mar. 7, 1978, Ser. No. 884,160

Int. Cl.³ G03B *1/18, 17/02*

U.S. Cl. 354—173 **13 Claims**



1. A camera comprising:

a powered film advancing mechanism for advancing a strip of film having opposed side edges beyond an exposure location;

lens means for directing light onto a portion of said film at said exposure location;

shutter means for closing off the admission of light to said film during the advancement thereof;

sensing means responsive to the movement of the film, including a wheel which contacts a side edge of said film and which is rotatable thereby as the film advances, said wheel being rotatable about an axis which is transverse to the plane of the strip of film which it contacts; and

control means automatically actuated by said sensing means to stop the advancement of the film by the powered film advancing means when the film has been advanced a predetermined distance beyond the exposure location.

4,222,651

CAMERA FILM REWINDING DEVICE

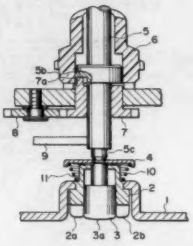
Fumio Urano, Omiya, and Takumi Kobayashi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1978, Ser. No. 951,817

Claims priority, application Japan, Oct. 17, 1977, 52-139084[U]

Int. Cl.³ G03B *19/04, 17/38*

U.S. Cl. 354—214 **5 Claims**



1. In a film winding device in a camera having a sprocket shaft carrying a sprocket and a clutch mechanism disengaged from said sprocket by movement of said sprocket shaft and a locking member engaging said sprocket shaft to maintain the sprocket in a state for rewinding, the improvement comprising:

a camera body having a recess formed therein, a depressable button disposed in said recess, said button operably coupled to said sprocket shaft, a bearing member positioned in said recess around said button and fixed to said camera body; wherein depression of said button in said bearing causes said sprocket shaft to be moved and disengage said clutch mechanism and permit the film to be rewound;

means biasing said button to a position such that its outer surface is substantially flush with the outer surface of said bearing member;

a groove in said bearing member, and wherein said button is depressed to the depth of said groove; and

a locking member, said sprocket shaft having a section of reduced diameter to form an annular engagement surface whereby upon depression of said button said sprocket shaft is depressed and said locking member engages said annular surface to thereby maintain said clutch member in a disengaged position from said sprocket.

4,222,652

ELECTRIC SHUTTER FOR CAMERAS

Yasuo Ishiguro, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,268

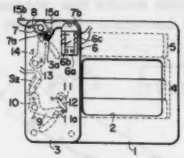
Claims priority, application Japan, Jan. 22, 1977, 52-6623[U]

Int. Cl.³ G03B *9/08, 17/00*

U.S. Cl. 354—234 **5 Claims**

1. An electric shutter device for cameras comprising a shutter base plate adapted to be attached to a camera body, a shutter closing driving member rotatably supported on said shutter base plate and movable between a cocked position and an uncocked position, a locking member rotatably supported on said shutter base plate and engageable with said driving member for locking said driving member in the cocked position, an armature lever operatively related to said locking

member, an electromagnetic device arranged adjacent to said armature lever, said electromagnetic device including a permanent magnet normally attracting said armature lever to retain said locking member in a position wherein said driving member is cocked, said armature lever being released from the permanent magnet to in turn release said locking member and said driving member when said electromagnetic device is energized, an exposure time controlling circuit connected to said



electromagnetic device, a current source battery connected to said exposure time controlling circuit and capable of supplying an electric current to said electromagnetic device to energize said electromagnetic device when a proper exposure time determined by said exposure time controlling circuit has elapsed, and a manually operable device arranged adjacent to said locking member on said camera body for operating said locking member to release said driving member on actuation of the manually operable device.

4,222,653

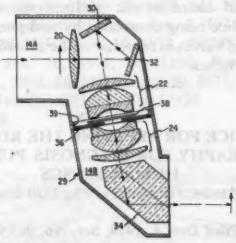
VISUAL EFFECTS OPTICAL RELAY

Leo Beiser, 151-77 28th Ave., Flushing, N.Y. 11354

Filed Dec. 4, 1978, Ser. No. 966,054

Int. Cl.³ G03B *9/02, 17/48, 35/00*

U.S. Cl. 354—270 **17 Claims**



1. An optical relay adapted to provide convenient access to the effective first aperture stop of a first imaging system, comprising:

a lens assembly for transferring the image from said first imaging system to a new image plane,

means for transferring the image of said first aperture stop to an aperture stop image plane of said lens assembly remote from said first aperture stop, and

light modification means positioned near said aperture stop image plane.

4,222,654

CAMERA ADAPTER BRACKET

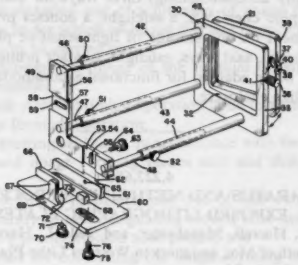
Donald J. Bodenhamer, 8064 Deverow Ct., Lewisville, N.C. 27023

Filed Jun. 1, 1979, Ser. No. 44,508

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—293 **4 Claims**

1. A camera support on which a camera is mounted for adaptation to a cathode ray tube having a bezel exposing said cathode ray tube in which the bezel is releasably secured to the frame of the cathode ray tube comprising; a camera support frame having means for mounting to said bezel, said camera support frame having an opening therein to expose said cathode ray tube in juxtaposition therewith, a camera supporting bracket pivotally connected to said camera support frame and having an opening therein complementing and substantially coextensive with said opening in said camera support frame, locking means for clamping said camera supporting bracket and said camera support frame together, a camera supporting means on which a camera is mounted and spaced from said



camera supporting bracket, means for adjusting the spacing of said camera supporting means having a camera mounted thereon relative to said cathode ray tube, said camera supporting means having a plate, said plate having a viewing area at least comparable to said opening in said camera supporting bracket, a camera guide means on which the camera is mounted, and means on said guide means cooperating with said plate for adjusting the position of said camera vertically and horizontally.

4,222,655

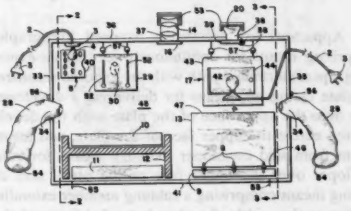
COMPACT PORTABLE DARKROOM

John T. Norris, 2810 DuPont Cir., Richmond, Va. 23222

Continuation-in-part of Ser. No. 956,696, Nov. 1, 1978, abandoned. This application May 21, 1979, Ser. No. 41,046

Int. Cl.³ G03D *13/00*

U.S. Cl. 354—308 **5 Claims**



1. A darkroom assembly comprised of a shell consisting essentially of six flat rectangular panels interconnected and dimensioned in a manner permitting erection of a box-like enclosure wherein four of said panels serve as the vertical panels of said box, a fifth panel serves as the top of said box, and the sixth panel serves as the bottom of said box, a first and second of said vertical panels being spaced apart in parallel planes and serving as the left and right side panels of said box, each of said side panels being provided with holes large enough to permit insertion of the operator's hands, a lightproof flexible sleeve attached to each of said holes and generally disposed on the exterior of said box, the third vertical panel serving as the rear panel of said box and supporting a rectangular enlarging easel by hinged engagement with the horizontally

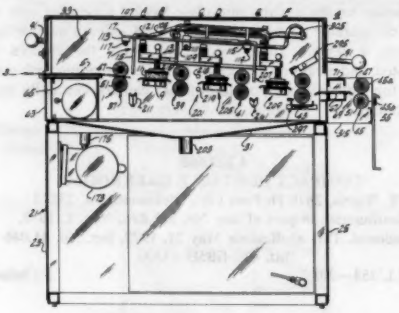
aligned lower edge of said easel (thereof), the fourth vertical panel serving as the front panel of said box and hingedly engaged at one edge to the forwardly disposed edge of another panel, said top panel being provided with a centrally positioned sight hole equipped with a concave lens and associated filter window, and a second sight hole in said top panel located adjacent the portion of said box having said enlarging easel, said second sight hole being equipped with a moveable filter window and flexible adapter means to facilitate light-proof coupling to an enlarger lens, said assembly including (box functionally accommodating) three trays for confinement of photographic chemicals, a safelight, a contact printer, and a compartment for the storage of light-sensitive photographic sheet material, said trays, safelight, contact printer and compartment being adapted for functional accommodation within said box-like enclosure.

4,222,656

APPARATUS AND METHOD FOR PROCESSING EXPOSED LITHOGRAPHIC PLATES

Robert E. Harrell, Manchester, and Tedd L. Harrell, Springfield, both of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Filed Mar. 9, 1979, Ser. No. 18,993
Int. Cl.³ G03D *5/04*
U.S. Cl. 354—317 **33 Claims**



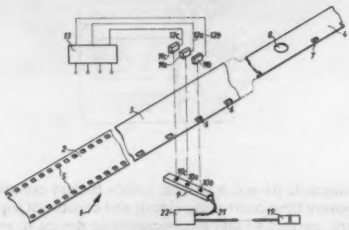
1. Apparatus for processing exposed lithographic plates comprising means for continuously feeding an exposed plate along a predetermined path with the exposed sensitized face of the plate facing up, means for delivering a developer for the plate onto the upper face of the plate with the developer distributed across the upper face of the plate, and means downstream from said developer delivery means for rubbing the developer over the upper face of the plate, said developer rubbing means comprising a rubbing member extending generally across the width of a plate being fed forward thereunder and means for moving said rubbing member at least laterally back and forth relative to said path to rub in the developer, the means for delivering the developer onto the upper face of the plate for being rubbed over the upper face of the plate comprising nozzle means for delivering developer onto the upper face of the plate as the plate is fed forward by said feeding means, means mounting the nozzle means for movement generally transversely of said path, means for moving the nozzle means generally transversely of said path back and forth over the plate with the nozzle means and its range of movement such that it applies developer generally throughout the width of the plate, and means for continuously pumping developer from a supply through the nozzle means for continuous delivery of developer onto the upper face of the plate as the nozzle means moves back and forth over the plate.

4,222,657

CONTINUOUS FILM-DEVELOPING MACHINE

Jürgen Leuchter, Tutzing, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 26,824
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815162
Int. Cl.³ G03D *3/06*
U.S. Cl. 354—324 **5 Claims**



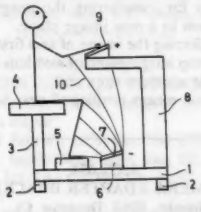
1. A machine for continuous developing of films having different formats and different patterns of film perforations characteristic of each film format, comprising a series of treatment baths consecutively arranged in the path of movement of the film; dosing devices cooperating with said baths and each including a plurality of valves controlled by a control device to adjust the flow rate of the processing liquid according to the format of the processed film; a set of pneumatic scanning elements arranged transversely in said path of movement at one side of the processed film to direct air jets against the perforations characteristic of each film format; a corresponding set of pneumatically activated switches arranged opposite said scanning elements on the other side of the processed film to detect said characteristic perforations; and an electric switching device being controlled by said pneumatic switches to activate said valves in response to the actuation of respective pneumatic switches.

4,222,658

DEVICE FOR APPLYING THE KIRLIAN PHOTOGRAPHY FOR DIAGNOSIS PURPOSES ON HUMAN BEINGS

P. Friedrich Mandel, Hildastrasse 13,, 7520 Bruchsal, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,916
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754031
Int. Cl.³ G03B *19/00, 41/00*
U.S. Cl. 354—354 **3 Claims**



1. An apparatus for creating pictures reproducable at any time in accurate diagnosis of living conditions with humans by application of Kirlian photography, which includes: a seat, first supporting means for supporting said seat, said seat being insulated with regard to said first supporting means, a foot rest, second supporting means for supporting said foot rest, said foot rest being insulated relative to said second supporting means

and being arranged ahead of and at a level below said seat, a bottom electrode, third supporting means for supporting said bottom electrode, said bottom electrode being arranged in spaced relationship to and in front of said foot rest and being insulated relative to sid third supporting means, a plate electrode for holding film paper arranged above said bottom electrode, fourth supporting means for supporting said plate electrode, said plate electrode being arranged above said bottom electrode and being insulated relative to said fourth supporting means, and a HF generator, said bottom electrode and said plate electrode being respectively connected to the poles of said HF generator.

4,222,659

COPYING APPARATUS FOR SHEET ORIGINALS AND THICKER ORIGINALS

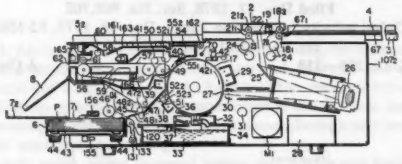
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 860,457, Dec. 14, 1977, which is a continuation of Ser. No. 588,228, Jun. 19, 1975, which is a division of Ser. No. 583,247, Jun. 3, 1975, Pat. No. 4,009,955, which is a continuation of Ser. No. 461,104, Apr. 15, 1974, which is a division of Ser. No. 258,820, Jun. 1, 1972, Pat. No. 3,804,512. This application May 23, 1978, Ser. No. 908,829

Claims priority, application Japan, Jun. 3, 1971, 46/38917; Jun. 9, 1971, 46/48632[U]; Jun. 10, 1971, 46/38918; Jun. 10, 1971, 46/41195; Jun. 10, 1971, 46/41196; Jun. 10, 1971, 46/41197; Jun. 21, 1971, 46/44611; Aug. 30, 1971, 46/66740

Int. Cl.[3] G03G *15/00, 15/28*

U.S. Cl. 355—14 R **4 Claims**



2. In a method for controlling the transfer material feeding operation in an electrophotographic apparatus including a rotatable photosensitive medium, reciprocable means for scaning an original and projecting an image light of the original onto said photosensitive medium, means for forming an electrostatic latent image on said photosensitive medium, means for forming a developed image on a transfer material corresponding to the electrostatic latent image and means for feeding the transfer material, the improvement comprising the steps of controlling the transfer material feeding operation of said transfer material feeding means by a feed signal produced by said reciprocable means in accordance with movement thereof and rotating said photosensitive medium at least two rotations for one reciprocation of said reciprocable means, wherein said reciprocable means is advanced in a first direction along a predetermined path for scanning during the first rotation and is returned in the opposite direction after completing the scanning operation.

4,222,660

IMAGE FORMING DEVICE WITH AUTOMATIC MODE SETTING

Katsushi Furuichi, Yokohama; Toshio Honma, Tokyo, and Katsumi Murakami, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,740

Claims priority, application Japan, Sep. 9, 1977, 52/108572; Sep. 9, 1977, 52/108580; Sep. 9, 1977, 52/108581

Int. Cl.[3] G03G *15/00*

U.S. Cl. 355—14 R **21 Claims**

4. An image forming apparatus, comprising:

means for designating one of a plurality of image forming conditions under which an image forming operation of an original is to be carried out;

means for forming an image of the original on an image bearing member;

a timer which starts its timing operation upon termination of the image forming operation;

means for resetting said timer in accordance with the operation of said image forming means and said designating means;

means for setting a predetermined one of said conditions, independently of said designating means, after said timer measures a predetermined time period; and

control means for controlling the image forming means to execute the image forming operation under the condition determined by said designating means and said setting means.

4,222,661

PROCESS AND APPARATUS FOR PRINTING TRANSPARENCIES

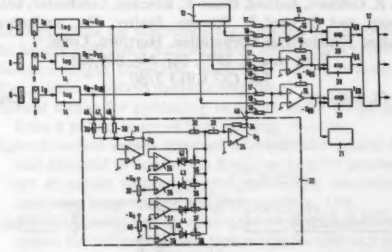
Robert Wahli, Unterengstringen, and Jürgen Pinkert, Marly, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Mar. 9, 1978, Ser. No. 884,977

Claims priority, application Switzerland, Mar. 11, 1977, 3097/77

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—38 **13 Claims**



10. An apparatus for printing transparencies, comprising a printing light source, a support for the original to be printed, a support for photo-sensitive reversal material, an imaging lens, servo-operated colour control filters and an automatic exposure control acting thereon, the exposure control comprising; first means for determining the colour densities of the original in the three primary colours; second means for determining the neutral density of the original to be printed; third means which lengthen or shorten the exposure times in the three primary colours from the values for a reference original in dependence upon the variations of the neutral density and of the colour densities from the corresponding values of a reference original; and fourth means which respond to the difference between the neutral density of the original to be printed and the neutral density of the reference original and which oppose at least to some extent a further lengthening and/or shortening of the

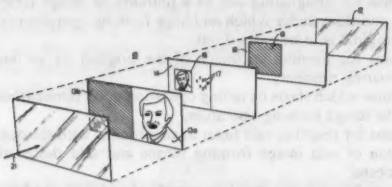
exposure time when such difference exceeds a first positive limit and/or falls short of a second negative limit.

4,222,662

ACCESS CONTROL SYSTEM

Herman Kruegle, Riverdale, N.J., assignor to Visual Methods, Inc., Westwood, N.J.

Division of Ser. No. 868,522, Jan. 11, 1978, Pat. No. 4,175,775.
This application Apr. 4, 1979, Ser. No. 27,165
Int. Cl.[3] H04N *7/18;* G03B *27/52;* G09F *3/02*
U.S. Cl. 355—40 **7 Claims**



1. Apparatus for reading an identification card of the type that includes (1) visible indicia decriptive of an authorized holder; and (2) further visible indicia descriptive of said holder sandwiched between a reflecting medium and a filter which is opaque to visible radiation but substantially transparent to infra-red or ultra violet radiation, said apparatus comprising:

a source of a beam of infra-red or ultra-violet radiation;

means for directing said beam of infra-red or ultra-violet radiation onto the surface of said card and substantially normal thereto, thereby to cause said beam to be reflected off said reflecting medium and to be modulated by the information contained by said further visible indicia; and

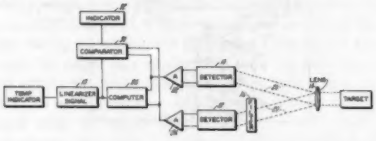
means, substantially aligned with the normal to said surface and responsive to said modulated, reflected infra-red or ultra-violet beam, for detecting said further visible indicia.

4,222,663

OPTICAL PYROMETER AND TECHNIQUE FOR TEMPERATURE MEASUREMENT

John R. Gebhart, Enfield; Bruce E. Kinchen, Colchester, both of Conn., and Richard R. Strange, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1977, Ser. No. 820,658
Int. Cl.[2] G01J *5/60*
U.S. Cl. 356—45 **7 Claims**



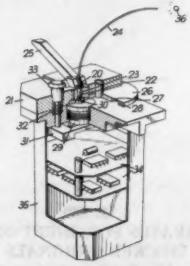
1. An optical pyrometer for measuring temperature of a remote target having a lens adapted to collect the energy emitted from the target, means including a fiber optic bundle for transmitting the collected energy picked-up by said lens, a pair of detectors sensitive to both the energy emitted from the target and reflected energy having identical spectral characteristics connected to said fiber optic bundle, a filter imposed between the lens and one of said detectors for limiting the spectral range passing therethrough such that the wavelength interval is contained within the band of the wavelengths sensed by the other detector, comparator means responsive to the output of said detectors for producing an indication whenever the temperature indicated by said two detectors are identical, high speed computer means also responsive to the output of said detectors for producing an output that compensates for the presence of reflected energy by estimating the magnitude of the reflected energy component.

4,222,664

FIBRE OPTIC CABLE TERMINATION TESTING

Robin D. Beasley, Chatham, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Sep. 20, 1978, Ser. No. 944,194
Claims priority, application United Kingdom, Sep. 26, 1977, 39909/77
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—73.1 **11 Claims**



1. A method of testing a ferruled termination of a fibre optic cable comprising the steps of:

illuminating the active optical area of the cable at the end of said cable remote from said termination; and

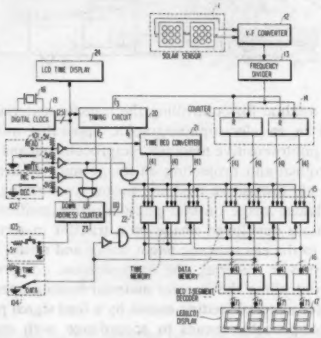
successively measuring through each of a series of restrictions each having an aperture of different area aligned with the ferrule the light energy output from said termination.

4,222,665

LONG-TERM METER-RECORDER FOR SOLAR CELL OUTPUT POWER

Hiroshi Tachizawa, and Asaji Kawano, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1978, Ser. No. 968,705
Claims priority, application Japan, Dec. 13, 1977, 52-150230
Int. Cl.[3] G01J *1/42;* G01R *31/26*
U.S. Cl. 356—218 **4 Claims**



1. A meter-recorder for solar cell output power which measures output power of a solar cell and records the measured data and the date of the measurement, comprising:

first means for converting an irradiation intensity of solar rays into a voltage;

second means for converting the converted voltage into a frequency;

third means for counting the converted frequency over a predetermined period to produce measured data;

fourth means for storing said measured data in a first address section;

fifth means for generating a digital date information;

sixth means for storing said digital date information in a second address section;

seventh means for providing a first control signal to designate said predetermined period, and a second control signal to designate an address number in said first and second address sections so that the measured data and the date of the measurement may be stored respectively in the same number of addresses in said first and second address sections; and

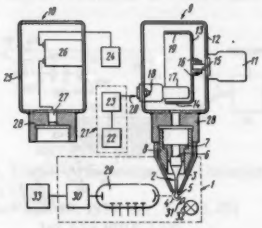
eighth means for displaying either the measured data or the date of the measurement in said fourth or sixth means, respectively.

4,222,666

APPARATUS FOR MEASURING AND CORRECTING CALIBRATION CHARACTERISTIC OF PHOTOELECTRIC AEROSOL ANALYZER

Evgeny S. Tumanov, ulitsa Shelkovichnaya, 184, kv. 48; Nikolai V. Zhamkov, ulitsa Mokhovaya, 33/1, and Lev A. Kudryavtsev, ulitsa Shelkovichnaya, 182, kv. 72, all of Saratov, U.S.S.R.

Filed Jul. 12, 1978, Ser. No. 924,098
Claims priority, application U.S.S.R., Jul. 13, 1977, 2508561
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—243 **4 Claims**



1. An apparatus for measuring and correcting the calibration characteristic of a photoelectric aerosol analyzer having a nozzle and a light source and a light-sensitive receiver between which an optical coupling is established at the moment that an aerosol particle under measurement passes through said nozzle, said apparatus comprising:

light guide means disposed within said nozzle and having a first end face located in said photoelectric aerosol analyzer and made as a ball for providing an even distribution of the light flux in a working zone of said analyzer, said light guide means having a second, flat, end face;

controllable light pulse generator means installed above said flat end face of said light guide means for measuring and correcting the calibration characteristic of the photoelectric aerosol analyzer;

a housing of said controllable light pulse generator means;

a light chopper of said controllable light pulse generator means having a gauged hole and an inner surface and disposed within said housing of said controllable light pulse generator means;

a light source of said controllable light pulse generator means installed in said housing of said controllable light pulse generator means in front of said light chopper so that the light flux produced by said light source passes through said gauged hole of said light chopper and impinges on said flat end face of said light guide means;

a light adjuster of said controllable light pulse generator means having an output electrically coupled to said light source of said controllable light pulse generator means;

an electric motor of said controllable light pulse generator means having a shaft mechanically coupled with said light chopper;

light flux meter means for measuring the intensity of the light flux in the working zone of said photoelectric aerosol analyzer, and installed above said flat end face of said light guide means to effect the measurement;

a housing of said light flux meter means;

a light-sensitive receiver of said light flux meter means disposed within said housing of said light flux meter means and coupled optically to said flat end face of said light guide means;

a direct voltage source of said light flux meter means having an input and an output, and disposed within said housing of said light flux meter means and having said output coupled to said light-sensitive receiver of said light flux meter means; and

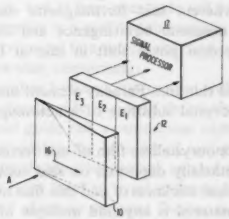
a galvanometer of said light flux meter means having an input coupled to said output of said direct voltage source.

4,222,667

FIZEAU FRINGE LIGHT EVALUATOR AND METHOD

Charles R. Layne, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Aug. 24, 1977, Ser. No. 827,430
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—346 **21 Claims**



14. Apparatus for discriminating between pulsed beams of light having coherence lengths above and below a preselected coherence length threshold, such light having wavelengths falling within a desired range, comprising:

optical means for producing an interference fringe pattern from a pulsed beam of light incident thereon;

light detection means disposed adjacent said optical means and disposed to receive the fringe pattern for producing a set of output signals proportional to the maximum and minimum intensities of the fringe pattern; and

signal processing means connected to said light detection means for comparing such output signals with one another to determine whether the coherence length of the light is above or below the preselected coherence length threshold.

4,222,668

FERRIMAGNETIC FARADAY ELEMENTS FOR RING LASERS

Rodney D. Henry, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 23, 1978, Ser. No. 880,408
Int. Cl.[2] G01B *9/02*; G01P *9/00*
U.S. Cl. 356—350 **21 Claims**

1. A ring laser comprising:

an optical cavity formed as a closed path describing a ring;

light amplifier means disposed in said optical cavity for producing at least two linearly polarized light beams counter-propagating around said ring;

Faraday cell means for producing a relatively large frequency difference between said at least two light beams at relatively small rotation rates of said ring; said Faraday cell comprising:

first and second quarter-wave plate means for changing the polarization of said at least two light beams from linear polarization to circular polarization where said at least two light beams are incident upon said Faraday cell and for changing the polarization of said at least two light beams from circular polarization to linear polarization where said at least two light beams exit from said Faraday cell; and

thin film Faraday element means of ferrimagnetic material interposed between said first and second quarter-wave

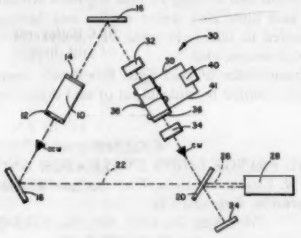


plate means for interacting with said at least two light beams wherein said ferrimagnetic material exhibits circular magnetic birefringence and thereby induces non-reciprocal phase shift in said at least two light beams;

wherein said thin film Faraday element means comprises:

a single crystal substrate of a non-magnetic material; and

a thin monocrystalline film of said ferrimagnetic material epitaxially deposited on said substrate, wherein the optical thickness of said thin film of said ferrimagnetic material is any odd multiple of one-half of a wavelength of the light of said light beams propagating in said ferrimagnetic material.

4,222,669

INTERFEROMETER FOR DETERMINING THE SHAPE OF AN OBJECT

Albert Frosch, Herrenberg; Gerhard Holzinger, Sindelfingen; Walter Jaerisch, Boeblingen, and Claus Scheuing, Lorch, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,053

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658399

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—360 **25 Claims**

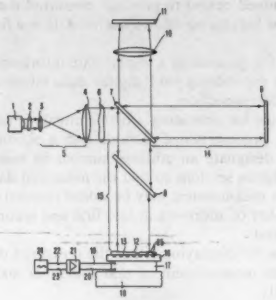
1. A method for analyzing the planarity of the surface of an object comprising:

A. generating a light beam of monochromatic coherent light,

B. splitting said light beam into a reference beam and an object beam and recombining the reflected reference and object beams into a view path,

C. positioning an object in said object beam with the surface thereof normal to said object beam,

D. vibrating said object to advance and recede said surface thereof in a direction normal to said surface, with the vibration being in a pattern wherein the receding of said surface is substantially instantaneous relative to a slow said advance thereof, and



E. detecting the interference fringe changes in said view beam.

4,222,670

LIQUID SAMPLE ANALYZER

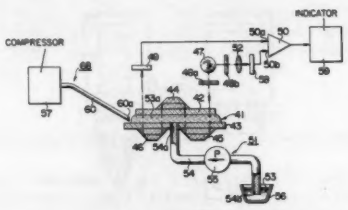
Kiyozo Koshiishi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1978, Ser. No. 921,336

Claims priority, application Japan, Jul. 26, 1977, 52-89449

Int. Cl.³ G01N *21/25, 1/10, 27/26*

U.S. Cl. 356—414 **8 Claims**



1. A liquid sample analyzer comprising: a sample determining channel formed as a small gap which is laterally open about a sufficient portion of its perimeter that any bubble in a liquid sample contained in said channel is expelled from said channel when the fluid pressure of said liquid sample is greater than atmospheric pressure; a sample supply unit for supplying said liquid sample into said channel; a rinsing unit for injecting a fluid into said channel to rinse the interior of said channel; and means for determining the optical density or ion concentration of said liquid sample located in said channel.

4,222,671

STATIC MIXER

Oscar P. Gilmore, 2804 Shenandoah Rd., Riverside, Calif. 92506

Division of Ser. No. 670,388, Mar. 25, 1976, Pat. No. 4,112,520. This application Sep. 5, 1978, Ser. No. 939,816

Int. Cl.³ B01F *5/24*

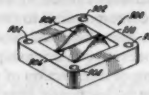
U.S. Cl. 366—337 **2 Claims**

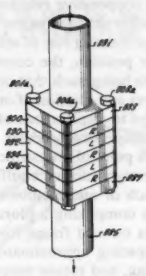
1. A static mixer comprising:

a plurality of mixer segments, each formed with an aperture therein, and means for detachably connecting said segments to one another to form a unitary laminated body, the apertures of each segment being in registry with corresponding apertures of immediately adjacent segments;

each of said apertures being rectangular and having a web positioned therein, each of said webs having a first edge

extending diagonally across one end of its respective aperture from one corner thereof to the opposite corner; and a second edge extending diagonally across the other end of its aperture between the other two opposite corners





of the aperture; the mid-portion of said web being substantially parallel to the side walls of said aperture; and

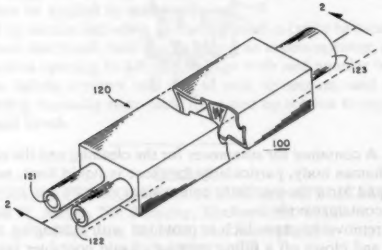
adjacent edges of webs in mutually registering adjacent apertures of different ones of said segments being positioned at an angle with respect to one another.

4,222,672

STATIC MIXER

Milton C. Shaw, Tempe, Ariz., assignor to University Patents, Inc., Norwalk, Conn.

Filed Apr. 19, 1979, Ser. No. 31,451
Int. Cl.[2] B01F *5/06*
U.S. Cl. 366—338 **38 Claims**



1. Apparatus for mixing fluids, comprising:

a first elongated enclosure defining a first flow channel;

a second elongated enclosure adjacent said first enclosure and having a wall element in common therewith, said second enclosure having an undulating cross-section that defines a second flow channel which is an undulating flow channel;

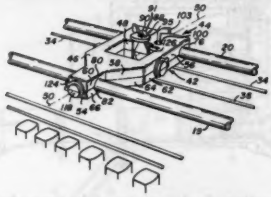
said common wall element having openings therein at about longitudinal positions thereof corresponding to the peaks and valleys of the undulations of said second flow channel.

4,222,673

PRINT HEAD CARRIAGE ASSEMBLY FOR SERIAL PRINTERS

Mario G. Plaza, Fremont, and Helmut K. Waibel, Hayward, both of Calif., assignors to Durango Systems, Inc., San Jose, Calif.

Filed Sep. 20, 1978, Ser. No. 943,790
Int. Cl.[3] B41J *11/00, 25/30*
U.S. Cl. 400—56 **14 Claims**



1. In a printer apparatus having a print head mounted to a carriage assembly with said print head adapted to be oriented normal to a print medium, a platen about which is wrapped said print medium, and at least one guide rail adapted to guide said carriage assembly in a motion substantially parallel to said platen, the improvement in a print head carriage assembly for said printer apparatus, comprising:

a platform member having a top surface and a first channel extending laterally side-to-side of the platform member for receiving said guide rail, a central seat within the platform member for seating the housing of said print head with said print head oriented normal to said platen so as to permit said print head to print upon said print medium, wherein said platform member further comprises a first and a second carriage segment which are duplicates of one another and aligned in face-to-face abutting relationship, each of said first and second carriage segments having a central opening symmetrical about a longitudinal center line of the respective segment to form said central seat, each of said first and second carriage segments forming a first groove extending laterally across the segment and normal to said longitudinal center line of the respective carriage segment to form said first channel,

means for securing said print head in place to the platform member when said print head is seated within the central seat and oriented normal to said platen, said means for securing said print head further including a clamp pivotable about a post anchored about the top surface of one of said carriage segments and having an axis normal to the axis of said first channel, said clamp forming a tab over the top surface of the carriage and pivotable between a first position adapted to clamp said print head and a second position remote from said print head whereby the tab may be rotated in and out of engagement with said print head when said print head is seated in the central opening,

manifold adjustment means for adjusting the position of said print head within the central seat with respect to the perpendicular distance between said print head and said first channel, and

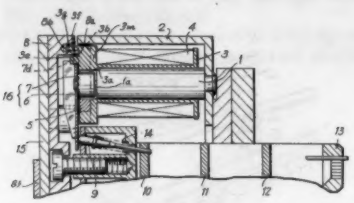
fastening means for fastening the first and second carriage segments in aligned face-to-face relationship, whereby the central opening provides clearance to receive said print head with said print head supported by one of said carriage segments.

4,222,674

HEAD PORTION OF A DOT PRINTER

Masahiko Mori; Seiji Hanaoka, and Takao Kobayashi, all of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagao, both of, Japan

Filed May 11, 1978, Ser. No. 905,085
Claims priority, application Japan, May 13, 1977, 52-55111
Int. Cl.[3] B41J 3/12
U.S. Cl. 400—124 20 Claims



1. A head portion of a dot printer of the type wherein activation of an electromagnet provides for thrust of a needle, comprising:

a first, cup-shaped yoke;

an electromagnet including a fixed iron core securely attached to said yoke, said iron core having an end portion;

a movable element disposed for movement by activation of said electromagnet from a rest position to a thrust position;

biasing means for returning said movable element from said thrust position to said rest position;

a second yoke shaped for fitting within said first yoke and for permitting movement of said element therethrough relative to said iron core;

a fulcrum member abutting said fixed magnetic core, said fulcrum member including a coil frame and fulcrum portion integral with each other, said member having a stepped surface abutting said end portion for positioning same relative to said fulcrum member and said movable element, said needle having a butt end; and

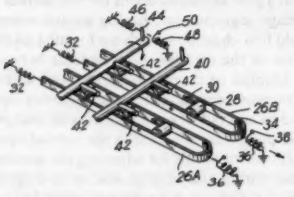
a holding member for holding said movable element against said fulcrum portion.

4,222,675

LOW PROFILE KEYBOARD OPERATOR

Richard W. Brown, Greenwich, Conn.; Lloyd E. Alterton, Sunnyvale; Joseph Eckerle, Redwood City; Brian J. Grossi, Menlo Park, and William A. Stephens, Long Beach, all of Calif., assignors to Savin Corporation, Valhalla, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,916
Int. Cl.[3] B41J 5/08, 29/00
U.S. Cl. 400—474 13 Claims



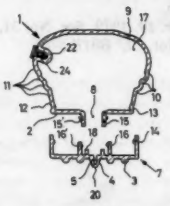
1. An operating system for a keyboard having a plurality of keys to be operated including in combination, a plurality of first matrix forming means, each of said first matrix forming means comprising a shaft mounted for rotary movement from a home position to an active position and a plurality of crank arms carried by said shaft for rotation therewith at locations therealong spaced by a distance approximating equal to the interkey spacing of said keyboard, a plurality of second matrix forming means, each of said second matrix forming means comprising a member movable relative to said shafts and a plurality of second elements carried by said member at spaced locations therealong corresponding to the interkey spacing of said keyboard, means mounting said first and second matrix forming means in cooperative relationship to form a generally planar matrix the points of intersection of which are adapted to be positioned adjacent to keyboard keys when said system is placed in operative relationship with a keyboard, means for moving one of said members to bring the second elements carried thereby into cooperative relationship with crank arms carried by the respective shafts adjacent to said points of intersection and means for rotating one of said shafts from its home position to its active position, the construction and arrangement of said elements being such that concomitant movement of one of said members and rotation of one of said shafts causes one of said crank arms to displace one of said second elements in a direction generally perpendicular to the plane of said matrix adjacent to the point of intersection of said one member and said one shaft through a distance sufficient to operate a key of said keyboard, each of said members comprising a frame, said second elements comprising a plurality of rollers, means mounting said rollers on said frame for swinging movement with an interroller spacing approximately equal to said keyboard interkey spacing, and means supporting said frame for movement between a first position at which said rollers are out of the path of movement of said arms and a second position at which said rollers are in the path of said arms.

4,222,676

MASSAGE CONTAINER HAVING A DOUBLE CLOSURE

Erich Roth, Bad Ems, Fed. Rep. of Germany, assignor to Dr. Wachter Kurmittel GmbH, Bad Ems, Fed. Rep. of Germany

Filed Nov. 2, 1978, Ser. No. 956,895
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749156; Aug. 24, 1978, 2836995
Int. Cl.[3] A46B 11/00
U.S. Cl. 401—28 6 Claims



1. A container for substances for the cleaning and the care of the human body, particularly for those in liquid form, such as a liquid for a shower bath, comprising:

a container body;

a removable cap which is provided with massaging means and closes off a filling opening of said container body;

massaging means being provided in the surface of said cap, said cap also being provided with at least one passage which extends from the inside toward the outside and has a removable closure;

said container body having a rounded-off, oblong shape of a piece of soap;

two connection means being provided between said container body and said cap wherein, as a first connection means, the surface of said container body which is covered by said cap is offset by a circumferential edge provided with a circumferential groove, inner bulges of said cap engaging said circumferential groove for support; and

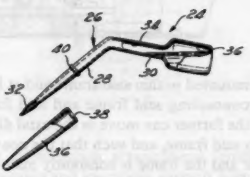
as a second connection means, an annular projection provided with a circumferential flange and extending outwardly from said surface of said container body, said annular projection being engaged by an annular bulge of an annular web which extends inwardly from said cap, said first and second connection means providing simultaneous sealing action for the container.

4,222,677

TOOL FOR THE DETAILED APPLICATION OF A FLUENT MATERIAL

Victoria Cervantes, 5538 Capellina Way, Santa Barbara, Calif. 93111

Filed Mar. 22, 1979, Ser. No. 22,795
Int. Cl.³ A46B *11/00*
U.S. Cl. 401—129 **1 Claim**



1. A tool for the detailed application of a fluent material comprising:

an elongated handle section;

a tip section attached to an outer extremity of said handle section, said tip section comprising a brush, said tip section having a first longitudinal center axis;

said handle section formed into a fore portion and an aft portion, said fore portion having a second longitudinal center axis, said aft portion having a third longitudinal center axis, said tip section attached to said fore portion with said first and second longitudinal center axes coinciding, said third longitudinal center axis being angularly disposed at approximately forty-five degrees relative to said second longitudinal center axis, whereby upon said aft section being grasped and fluent material being applied by said brush, said tip section is readily observable through a mirror and not obscured by the user's hand;

said handle section being hollow, said brush connecting with said hollow, whereby fluent material is to be conducted through said hollow into contact with said brush to therefore be applied by said brush; and

said tip section including an annular bead, a cap to be located over said brush, said cap including an access opening, said access opening to forcibly engage with said annular bead to tightly connect said cap to said tip section, said cap being manually removable from said tip section to expose said brush.

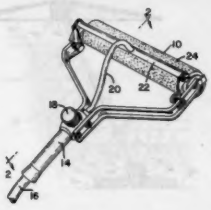
4,222,678

PRESSURE FED ROLLER TYPE FLUID APPLICATOR

Donald W. Miller, 240 Berkeley, Elmhurst, Ill. 60126

Filed Jun. 15, 1978, Ser. No. 915,603
Int. Cl.³ B05C *1/08*
U.S. Cl. 401—218 **5 Claims**

1. A roller type application device for applying a paint or other flowable material to a surface which device comprises an applicator roller, a frame having a handle forming portion and spaced arm members having means for rotatably supporting said roller, means for feeding material to the roller surface which is in the form of a relatively small diameter tube mounted relative to said roller so as to extend generally parallel to the axis of rotation of the roller and substantially in contact with the exterior surface of said roller, which feeder tube is apertured so as to discharge material supplied thereto onto the roller surface substantially throughout the axial dimension of the roller, said aperture in said feeder tube being in confrontation to said applicator surface and is formed as a slot extending substantially the length thereof for uniformly passing paint or other flowable material therethrough for application throughout substantially the axial dimension of the roller surface, means connected to said material feeding tube for supplying material to said tube and a valve for controlling the feeding of said material to said tube, said spaced arm members have means for supporting said roller which includes releaseable trunnion forming members and associated end caps for said roller which end caps include an aperture and compressible roller engaging flange portion for accommodating variations in the diameter of the roller, said releaseable trunnion



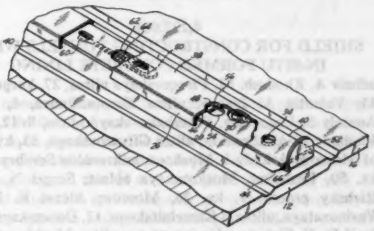
includes a flexible flat member and a pin mounted thereon, said flat member urging said pin into engagement in said aperture for releaseable support of said roller, means for securing said flat member to said spaced arm members at a position spaced from said pin, said tube for feeding material to the roller surface is mounted at its ends on spring pressed arm members having means for adjusting the position of said tube relative to the surface of the applicator roller, said tube mounting arm members are pivoted on said frame and have associated torsion springs for urging the tube in the direction of the roller surface, and said torsion springs having an intermediate portion coupled to said means for securing said flat member and an end portion coupled to said tube for feeding material.

4,222,679

LOOSE-LEAF BINDER

Felix Luogameno, Bergenfield, N.J., assignor to American Loose Leaf Corporation, Clifton, N.J.

Filed Nov. 8, 1978, Ser. No. 958,606
Int. Cl.³ B42F *3/04*
U.S. Cl. 402—75 **12 Claims**



1. A loose leaf binder mechanism comprising: top and bottom covers, a backbone connecting said top and bottom covers, a binding mechanism including a detachable longitudinal bar affixed to one of said covers, said detachable longitudinal bar having a projection with a groove thereon extending therefrom, a channel guide affixed to one of said covers, a flat latching bar reciprocally received within said channel guide for cooperating with said projection to join said binding mechanism to one of said covers, and indented means formed on the

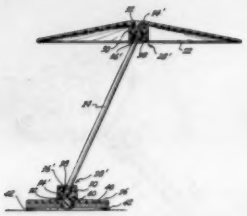
opposing sides of said channel guide and slidingly contacting the latching bar so as to provide a bearing surface as the latching bar slides between the top and sides of the channel, and the top of the indented means, and to substantially restrict the movement of said latching bar to reciprocal movement.

4,222,680

VARIABLE POSITION FRICTION JOINT

Charles E. Browning, 10415 SE. 174th, Renton, Wash. 98055

Filed Mar. 6, 1978, Ser. No. 883,921
Int. Cl.² F16C *11/06*
U.S. Cl. 403—56 **8 Claims**



1. A variable position friction joint, comprising:
a housing defining an open-ended, cylindrical housing cavity;
a lining means in the form of a section of elastic tubing snugly received within said housing cavity; and
a joint member, having a rounded end with annular hills and valleys arranged in the surface thereof generally laterally of the axis of the joint member, wherein:
said elastic tubing lining means comprises an elastic material softer than said housing and said rounded end of said joint member, and defines a lining cavity receiving said rounded end of said joint member with a snug friction fit;
at least the hill portions of said rounded end of said joint member being sized larger than the corresponding portions of said lining cavity prior to assembly of said joint, causing said rounded end of said joint member to compress at least some portions of said lining means when said joint is assembled, to provide said snug friction fit and to permit selective relative movement between said joint member and said housing, the open-ended nature of the housing cavity and its elastic tubular lining also enabling the ready assembly and disassembly of the joint simply by pushing the parts together or a pulling of the parts apart, as the case may be.

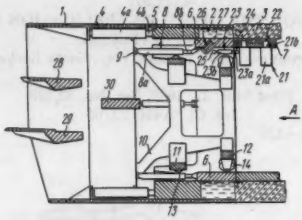
4,222,681

SHIELD FOR CONSTRUCTING TUNNELS WITH IN-SITU FORMED CONCRETE LINING

Vladimir A. Khodosh, M. Pirogovskaya ulitsa, 27, korpus 1, kv. 11; Valentin A. Ivanov, ulitsa Konstantinova, 4, kv. 25; Anatoly S. Lugovtsov, Scherbakovskaya ulitsa, 8/12, kv. 28; Vladimir A. Alikhashkin, ulitsa Gilyarovskogo, 33, kv. 69, all of Moscow; Arkady I. Mozhaev, mikroraion Serebryanka, 3, kv. 50, Pushkino, Moskovskaya oblast; Sergei N. Vlasov, Rizhsky proezd, 9, kv. 26, Moscow; Alexei K. Kartsev, Yasinovataya, ulitsa B Khmelnitskogo, 12, Donetskaya oblast; Iosif D. Y. Fishman, Yasinovataya, ulitsa Mashinostroitelei, 13, kv. 20, Donetskaya oblast, and Ivan N. Grigoriev, Yasinovataya, ulitsa Mashinostroitelei, 7, kv. 6, Donetskaya oblast, all of U.S.S.R.

Filed Oct. 10, 1978, Ser. No. 949,740
Int. Cl.² E01G *3/04*; E21D *11/10*
U.S. Cl. 405—141 **3 Claims**

1. A shield for the construction of tunnels with an in-situ formed concrete lining, comprising: a frame having a longitudinal axis; drive means operatively associated with and located within said frame for advancing said shield along a defined path; means operatively associated with and located within said frame for absorbing the thrust force of said drive means and for transferring the thrust force to the concrete during the process of its compaction; an inner support located with said frame and rigidly secured thereto; and a forming unit mounted on said inner support for molding the inner surface of the concrete lining, said forming unit including a former which is



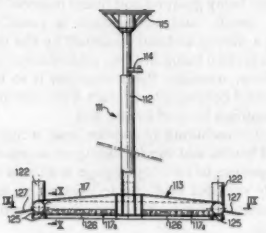
coaxially mounted within said frame and at least one hydraulic jack interconnecting said frame and said former in a manner such that the former can move in the axial direction within and relative to said frame, and such that the coaxial relationship of the former and the frame is constantly maintained by virtue of the mounting of the former unit on said inner support which is secured to said frame.

4,222,682

PLATFORMS FOR SEA-BOTTOM EXPLOITATION

Robert Vilain, Maisons-Alfort, France, assignor to Enterprise d'Equipments Mechaniques et Hydrauliques, E.M.H., France

Continuation-in-part of Ser. No. 810,190, Jun. 27, 1977, Pat. No. 4,127,004. This application Dec. 30, 1977, Ser. No. 866,393
Claims priority, application France, Jun. 30, 1976, 76 19967; Jun. 24, 1977, 77 19480
Int. Cl.² E02D *21/00*
U.S. Cl. 405—203 **13 Claims**



1. A sea-bottom exploitation or development installation, forming an emerging mooring and loading column, connected with a gravity base intended to be laid on the sea bottom, wherein the said column is rigidly and permanently secured to the said base wherein said base is substantially symmetrical with respect to a vertical central axis thereof, and has a structure substantially in the form of a frame whose periphery is defined by a plurality of straight side members at least one portion of said frame comprising ballast tanks or chambers, wherein the said column is mounted in perpendicular relationship to the medial plan of the said frame and substantially at its center, and is connected to the said frame by connecting elements extending in substantially transverse relationship to the longitudinal axis of the column; at least one transverse dimension of the said frame being greater than the depth of the sea bottom at the selected installation site.

4,222,683

OFFSHORE CONSTRUCTION

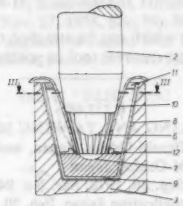
Peter Schaloske, Oberhausen; Wolfgang Küffel, Duisburg, and Franz J. Brinkmann, Mülheim, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,172

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742459; Apr. 1, 1978, 2814080

Int. Cl.[3] E02D *25/00*

U.S. Cl. 405—204 15 Claims



1. An offshore construction arrangement, comprising: a platform having raisable and lowerable support legs; substructure means for resting on a sea bed and supporting said legs; said legs engaging said substructure at a solid support surface and maintaining a funnel-shaped gap therebetween; and spring means in said funnel-shaped gap between side walls of said substructure and end portions of said legs, said spring means being supported on one of said side walls.

4,222,684

METHOD OF DRIVING SHEET PILES INTO A ROCK SUBSTRATUM

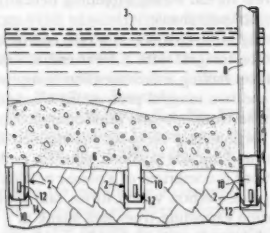
Winfried Rosenstock, Heyestr. 28, 3068 Oberndkirchen, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,435

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747937

Int. Cl.[2] E02D *7/12*

U.S. Cl. 405—232 10 Claims



1. A method of driving the lower ends of sheet piles into a rock substratum for the purpose of constructing a sheet pile wall, comprising the steps of

boring bore holes in the rock substratum and any over burden present at predetermined intervals along the intended sheet pile wall,

inserting a water-tight container containing an explosive charge into each bore hole,

selecting a small volume of the explosive charge relative to the volume of the container,

detonating, simultaneously the explosive charges of at least two adjacent bore holes to shatter the rock substratum in its internal structure but leave the substratum almost undamaged in its external form between the bore holes, and, subsequently driving sheet piles into the rock substratum.

4,222,685

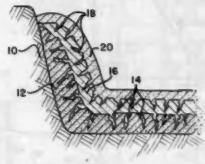
POND SEALING

Gene Jefferson, San Jose, Calif., and Martin Laborde, Santiago, Chile, assignors to Corporation de Fomento de la Produccion, Ojai, Calif. and Corporacion De Fomento De La Produccion, Santiago, Chile

Filed Mar. 20, 1979, Ser. No. 22,369

Int. Cl.[2] E02B *3/00*; E02D *3/12*

U.S. Cl. 405—270 17 Claims



17. A method of sealing a solar pond having a bottom covered with salt comprising:

applying a slurry having at least 35 weight percent soil particles of less than five micron to said salt to fill the interstices between the salt particles.

4,222,686

MINE ROOF SUPPORT

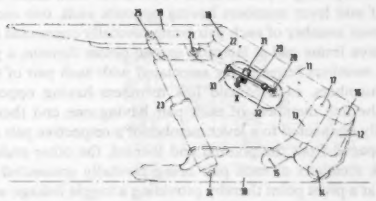
Gunter Bell, Horneburg, and Willy Watermann, Dortmund-Lanstrop, both of Fed. Rep. of Germany, assignors to Kloeckner Werke, Duisburg, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,437

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1977, 2749371

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—295 8 Claims



1. A mine roof support comprising a sole plate adapted to rest on the floor of a mine gallery and having a front end adapted to be directed to the face of the mine gallery and a rear end; a roof shield above said sole plate and having a front end extending beyond that of said sole plate and a rear end; fluid-operated extensible and collapsible prop means pivotably connected at opposite ends to said sole plate and said roof shield for pressing the latter against the roof of the mine gallery; a rear shield pivotably connected at one end to said rear end of said roof shield and including an angle with the latter; link means pivotably connecting the other end of said rear shield to said sole plate in the region of the rear end of the latter; means for feeding pressure fluid into said prop means; fluid-operated means between said roof shield and said rear shield for changing the included angle between said shields and comprising a cylinder element and a piston element slidably guided in said cylinder element; and means cooperating with said elements for stopping feeding of pressure fluid into said prop means

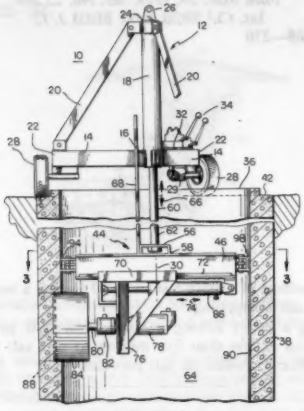
upon reaching of a maximum as well as upon reaching of a minimum included angle between said shields.

4,222,687

APPARATUS FOR BORING SEWER PIPE OPENING IN MANHOLE BASE

Richard L. Williams, 9180 Parker Rd., Harrod, Ohio 45850

Filed Jun. 12, 1978, Ser. No. 914,557
Int. Cl.³ B23B *41/00*
U.S. Cl. 408—79 **7 Claims**



1. Apparatus for boring an opening in the side wall of a hollow rigid member, said side wall having an inner surface surrounding an interior space, said apparatus comprising: a frame adapted to be positioned within said space; means on said frame for selectively engaging points on said inner surface of said side wall respectively on opposite sides of said space thereby to secure said frame at a selected location in said space; and means on said frame for boring said opening outwardly from said space through said side wall; said side wall engaging means comprising a pair of lever members at each frame end, each of said lever members having opposite ends, one end of each lever member of each pair being pivotally connected to a respective frame end at laterally spaced points thereon, a pair of link members respectively associated with each pair of said lever members, each of said link members having opposite ends, the link members of each pair having one end thereof pivotally connected to a lever member of a respective pair at a point spaced from the pivoted end thereof, the other ends of the link members of each pair being pivotally connected together at a pivot point thereby providing a toggle linkage with the respective pair of said lever members, and means operatively connected to said pivot points of both of said linkages for selectively extending and retracting the same thereby selectively to move said other ends of said lever members into and out of engagement with said inner surface of said side wall.

4,222,688

NUT REMOVAL TOOL

Lowell LeMay, 8341 Elm Rd., Millersville, Md. 21108

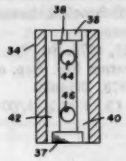
Filed Mar. 21, 1979, Ser. No. 22,610
Int. Cl.³ B23B *49/02*
U.S. Cl. 408—115 B **10 Claims**

1. A nut removal tool for removing unremovable nuts, comprising:

a body means;

a combination recess and first passageway in said; body means, said first passageway passing longitudinally through said body;

a plurality of additional passageways through said body to serve as drill guides; and



a holding means which can be attached to said body means to hold said nut removal tool in position.

4,222,689

DRILLING AND TAPPING SCREW

Isamu Fujiwara, Higashi-Osaka, Japan, assignor to Fujibyora Co., Ltd., Higashi-Osaka, Japan

Filed Sep. 26, 1978, Ser. No. 945,777
Claims priority, application Japan, Feb. 20, 1978, 53-21253[U]
Int. Cl.² F16B *25/00, 35/04*
U.S. Cl. 85—41 **3 Claims**

1. A drilling and tapping screw structure comprising:

a slender shank;

cutting screw thread means extending helically on an outer periphery of said shank;

tool receiving means formed at a rear end of said shank;

a drill portion integral with a front end of said shank, said drill portion having a cross-section comprising a central portion and two integral protrusions wherein said protrusions extend from opposite sides on opposite ends of said central portion, said cross-section defined by short side portions and long side portions, wherein each of said long side portions is comprised of a planar portion and a gently curved guide portion which forms said protrusions, said drill portion extending from said shank in a substantially truncated shape form with said long side portions having a base portion, said base portion having a diameter slightly larger than a diameter of said shank and slightly smaller than a diameter of said shank including said cutting screw thread means, said base portion diameter progressively increasing in a direction away from said rear end of said shank to a maximum diameter slightly smaller than said diameter of said shank including cutting screw thread means;

a tip positioned on an axis of said shank on said drill portion, said tip being comprised of a pair of tapered cutting faces, wherin said faces form a sharp edge and are symmetrically positioned with respect to an outermost point of said tip, with each of said faces having a width which progres-

sively increases in a direction away from said outermost point; and

a pair of ribs respectively formed centrally on said long side portions, said ribs extending longitudinally from said front end of said shank, said ribs narrowing in a direction away from said shank and having a peripheral surface and length about one-half the axial length of said drill portion.

4,222,690

DRILL HAVING CUTTING EDGES WITH THE GREATEST CURVATURE AT THE CENTRAL PORTION THEREOF

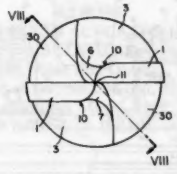
Ryosuke Hosoi, 5-9-10, Kami-minami, Hirano-ku, Osaka, Japan

Filed Nov. 17, 1978, Ser. No. 961,810

Claims priority, application Japan, Dec. 3, 1977, 52-145587; Dec. 3, 1977, 52-145588; Dec. 3, 1977, 52-145589; Jan. 31, 1978, 53-10136

Int. Cl.³ B23B *51/02*

U.S. Cl. 408—230 **2 Claims**



1. A drill comprising a pair of cutting edges each starting at the center of rotation of the drill and extending symmetrically with respect to said center and curved outwardly away from the direction of rotation of the drill with a greater curvature in the radial inner portion than in the outer peripheral portion of the drill when viewed from the bottom of the drill, each of the cutting edges being formed with a rake face starting at said center of rotation and having a rake angle approximately equal to zero at the radial inner portion of said rake face, said drill having twisted grooves, and means defining a cavity formed in said twisted grooves close to said starting end of each of the cutting edges to provide an increase in rake face at the inner radial portion of the cutting edge in the vicinity of said starting end of said cutting edge.

4,222,691

METHOD FOR MACHINING THE SCREW OF A COMPRESSION OR EXPANSION MACHINE AND A DEVICE FOR THE APPLICATION OF SAID METHOD

Bernard Zimmern, Neuilly sur Seine, France, assignor to Uniscrew Limited, Hamilton, Bermuda

Filed Apr. 18, 1978, Ser. No. 897,497

Claims priority, application France, Jun. 2, 1977, 77 16861

Int. Cl.² B23F *9/10, 15/00*

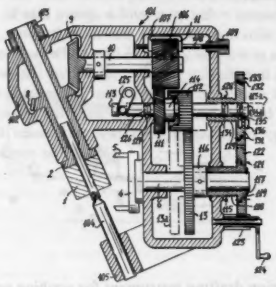
U.S. Cl. 409—26 **9 Claims**

1. In a method for machining a compression or expansion machine screw in which said screw cooperates with at least one pinion, the screw having at least one groove disposed in meshing engagement with at least one tooth of the pinion, all the teeth of any one pinion being disposed substantially on a cylinder and the lines of contact between a screw thread and the mating tooth flanks being disposed in a V which converges inwards to the center of the screw and in which said method comprises the steps of fixing a screw blank on a spindle which is driven in rotation, mounting at least one cutting tool on a tool-holder the shaft of which is coupled to the spindle by means of a kinematic chain, progressively displacing the tool-holder along its axis of rotation and causing the cutting tool to penetrate into the screw blank, the improvement comprising the further steps of:

(a) effecting a first movement of penetration by working solely with the tip of the cutting tool, without changing the relative angular position of the spindle and of the shaft of the tool-holder in the kinematic chain which couples these two elements;

(b) withdrawing the cutting tool from the screw blank;

(c) effecting a relative angular displacement of the tool-holder with respect to the spindle in a predetermined direction and to locate the tip of the cutting tool at least



partially opposite to a portion of the screw blank which was not machined during the first movement of tool penetration;

(d) effecting a second movement of penetration by working solely with the tip of the cutting tool, while progressively reducing said relative angular displacement; and

(e) withdrawing the cutting tool from the screw.

4,222,692

MACHINE TOOL FEED SYSTEM WITH ADJUSTABLE BEARINGS

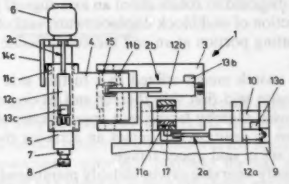
Rudolf Pavlovsky, Schaffhausen, Switzerland, assignor to George Fischer Aktiengesellschaft, Switzerland

Filed Nov. 6, 1978, Ser. No. 957,857

Claims priority, application Switzerland, Nov. 15, 1977, 13904/77

Int. Cl.³ F16C *21/00*

U.S. Cl. 409—141 **10 Claims**



1. A feed system for a machine tool of the type having a cutting tool for cutting a workpiece, a frame, a carriage and hydraulic piston-cylinder drive means for providing relative linear and swiveling movement between the tool and the workpiece on the frame, means for measuring the relative movement between the tool and workpiece, means for determining the force of the cutting tool against the workpiece and guide members on the frame for movably supporting the carriage, the improvement comprising

adjustable bearing means on said carriage for slidably mounting said carriage on said guide members, said bearing means including

dry-running friction bearings having an adjustable resistance to movement, and

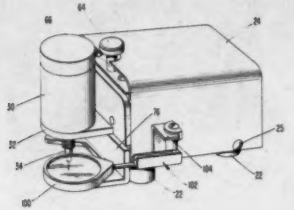
means for applying pressure to said bearings to adjust said resistance to movement to substantially one to ten times the force of the cutting tool against the workpiece.

4,222,693

PRECISION DRAFTING INSTRUMENT

Eugene E. Zang, Centreville, Va.; Joe S. Sheck, Gaithersburg, Md., and Clifford A. Calhoun, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 13, 1978, Ser. No. 969,047
Int. Cl.[3] B23B *45/02*; B23C *1/20*
U.S. Cl. 409—175 **4 Claims**



1. A precision drafting instrument for scribing small dots on a drafting medium including a substrate provided with a removable surface coating, comprising in combination:

housing means including a base and a multi-sided cover attached to said base forming an open-ended enclosure between said base and cover;

a multi-sided support means having upper and lower flanges where said lower flange is arranged on said base to mount said support means on said base within said enclosure;

a pair of guide means set spaced apart between said flanges and affixed thereto;

a multi-sided block slidably mounted on said pair of guide means for predetermined displacements between said upper and lower flanges;

a multi-legged support member having a leg affixed to said block at a first side thereof facing an open end of said housing means, and a further leg extended beyond said housing means and away therefrom;

a motor drive affixed to said extended leg of said support member;

a rotary element and a rotatable chuck removably holding said element attached at an end thereof to said motor drive and disposed to rotate about an axis aligned parallel to the direction of said block displacements, said element having a cutting portion at an end thereof opposite said attached end;

motor switch means affixed to a further side of said block opposite said first side thereof and having a control part disposed thereby facing said upper flange of said support means in position to contact an actuator therefor adjustably set in said upper flange;

a manually operable driver slidably maintained in said upper flange of said support means, said driver having an extended part thereof projecting through an opening medially situated in said housing cover, and an oppositely extended part thereof affixed to a still further side of said block;

a compression spring maintained in operable position axially aligned with said driver parts by having one end received within said block at a still further side thereof and an opposite end received within said lower flange of said support means;

a stop means adjustably set in said base and projecting through said spring in position to engage said block within said still further side thereof;

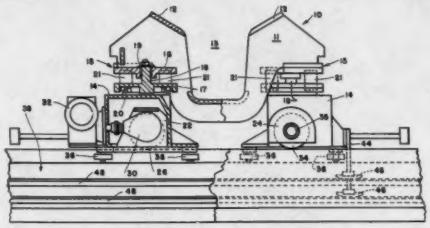
whereby said spring expanded holds said driver passively disposed with said cutting portion spaced from said drafting medium, and said switch means control part and said actuator therefor engaged to maintain said switch means open and thereby said motor drive inactive, wherefore said cutting portion is at rest in an ineffective disposition, and operation of said driver displacing said block on said guide means an initial extent disengages said control part from said actuator therefore to close said switch means and activate said motor drive, and a second extent brings said cutting portion in contact with said surface coating of said drafting medium wherefore rotation of said cutting portion removes surface coating to a depth set by adjustment of said stop means to predetermine displacement of said block against the compression of said spring.

4,222,694

INDUSTRIAL WORKPIECE TRANSPORTING CAR SYSTEM

Frederick W. A. Ward, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Aug. 14, 1978, Ser. No. 933,354
Int. Cl.[3] B60P *3/00*
U.S. Cl. 410—45 **7 Claims**



1. In an industrial car system for carrying and transporting a workpiece,

a transporting car adapted for use on tracks or floor surface and the like comprising:

a cradle frame having a supporting surface for carrying a workpiece,

said cradle frame having supportable means each including load transferring surfaces,

a truck assembly for each supportable means of said cradle frame arranged beneath an associated supportable means,

said truck assemblies each including means for transferring the load of said supportable means of said cradle frame to said truck assemblies in a manner that permits relative movement between said truck assemblies and said load transferring surfaces of said supportable means,

a pair of supporting wheels for each truck assembly having non-flanged supporting surfaces arranged to contact said tracks or floor surface, at least one pair being driven,

guiding means for each truck assembly secured thereto, and

wherein said system further comprises restraining means constructed and arranged to receive said guiding means for controlling the course of travel of said transporting car.

4,222,695

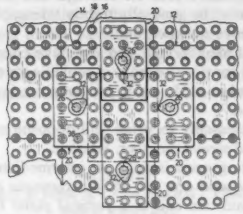
FLOOR MATTING

Anthanase K. Sarides, Willowdale, Canada

Filed Aug. 13, 1979, Ser. No. 66,348
Int. Cl.[3] B32B *3/26, 3/02*
U.S. Cl. 410—68 **3 Claims**

1. Floor matting comprising a plurality of rectangular panels each having a plurality of rows of upstanding hollow bosses, some of said bosses being located along two sides of the panel and laterally projecting beyond said sides, the other two sides of the panel being provided with a complementary number of upstanding projections which are inserted into the laterally projecting bosses of an adjacent panel to retain the panels in side by side relationship, the matting also comprising one or more retainers mounted thereon each of said retainers having a flat base with apertures positioned to correspond with the

disposition of the bosses on the panels to enable the base to be mounted on one or more panels with bosses extending into the



apertures, and each retainer also comprising a retainer member projecting upwardly from the base for engagement with an article placed on the matting.

4,222,696

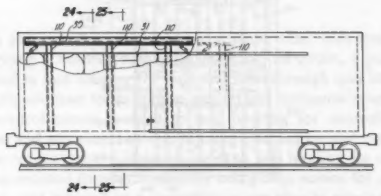
ADJUSTABLE FLUID ACTUATED HORIZONTAL BULKHEAD

Sergei G. Guins, 4496 Dobie Rd., Okemos, Mich. 48864

Continuation-in-part of Ser. No. 585,050, Jun. 9, 1975, Pat. No. 4,089,273. This application May 1, 1978, Ser. No. 901,627

Int. Cl.[3] B60P *7/14;* **B61D** *3/00, 45/00*

U.S. Cl. 410—128 **22 Claims**



1. An adjustable bulkhead adapted for movement in the vertical direction of the type having at least one structural member mounted in a substantially horizontal plane and at least one movable bulkhead panel operatively connected thereto by means of a clevis linkage with at least one air-operated actuating means adapted to operate such clevis linkage in such a manner as to expand said panel in a vertical direction against the lading to maintain a substantially constant loading thereon regardless of the amount of expansion of said movable bulkhead panel, wherein said air operated actuating means includes at least one air operated hydraulic actuating means supplied by an air supply of a fixed predetermined initial volume, said fixed volume air supply effecting a decreased pressure being applied to said hydraulic actuating means as the mechanical advantage of said clevis linkage comes into effect, thereby maintaining said constant loading.

3. An adjustable vertically acting bulkhead including at least one structural frame member adapted to be mounted in a substantially horizontal plane to suitable reinforcing members of the type found in transportation vehicles, and at least one movable bulkhead panel with means operatively connecting said structural frame member and said movable panel, said connecting means including at least one shaft member rotatably secured to said structural member, and at least one clevis linkage connected at one end to said shaft and at the other end to said movable bulkhead, and at least one actuating means to operate said connecting means to expand said panel against a lading and maintain a substantially constant loading thereon regardless of the amount of expansion of the movable bulkhead panel, wherein said actuating means include at least one connecting link fixedly mounted to said shaft, a hydraulic cylinder connected at one end to said link, and at the other end to said frame member, and means to operate said hydraulic cylinder, wherein said hydraulic cylinder operating means include a fixed volume air reservoir with filling means attached, a conduit connected at one end to said air reservoir and communicating with the interior thereof, an air-operated hydraulic pump connected to the other end of said conduit and adapted to be operated by the air from said reservoir, an oil reservoir connected to the inlet of said pump, a check valve connected to the outlet of said pump, a four-way valve connected to said check valve, said oil reservoir and said hydraulic cylinder in such a manner that when said four-way valve is in a first appropriate position, the hydraulic cylinder will expand causing said movable panel to move into engagement with a lading, after which said pump will stall, and when in a second appropriate position will cause the hydraulic cylinder to contract and move away from said lading.

4,222,697

DEVICE FOR REMOVING A STACK OF SHEETS OF PAPER

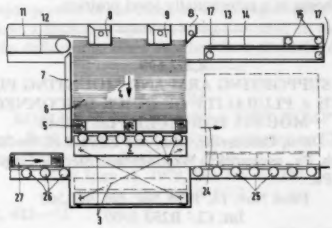
Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to VITS-Maschinenbau GmbH, Langenfeld, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,483

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751489

Int. Cl.[3] B65G *57/03*

U.S. Cl. 414—50 **6 Claims**



1. In a device for removing a stack of sheets of paper from a place of deposit to which the sheets are conveyed by a conveying means, said device comprising a platform for receiving the stack, means associated with said platform for the lowering thereof, in relation to a plane in which the sheets are conveyed onto the stack as the height of the stack increases, and a carrier unit insertable above the platform in the area of the place of deposit and onto which the sheets conveyed further to the place of deposit are stacked while the platform loaded with the stack is removed and replaced with an empty platform, the improvement comprising;

said carrier unit being composed of two plates arranged directly one above the other and each being insertable independently of one another into an upper area of the stack,

said upper plate having a triangular shape at a front end with the apex thereof at its front forming a triangular tip pointing towards the stack, and

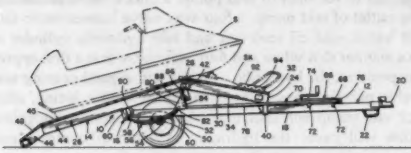
said lower plate having a straight configuration at a front end, the surface portion of said upper plate being inserted into the stack up to an end position, said surface portion being approximately equal to half a surface portion of the stack of sheets.

4,222,698

TRAILER ASSEMBLY FOR SNOWMOBILES

Stuart R. Boelter, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Apr. 17, 1978, Ser. No. 897,763
Int. Cl.[2] B60P 1/32, 3/06
U.S. Cl. 414—477 7 Claims



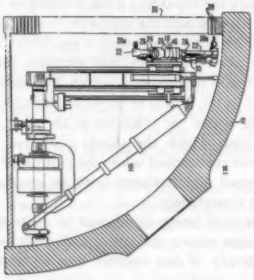
1. A trailer assembly comprising, in combination, a movable frame, a first support portion mounted on said frame, a second support portion mounted on said frame, in cooperative relationship with said first support portion, and means for adjusting the relative angular position between said first and second support portions, said adjusting means being constructed and arranged for moving said support portions between a first position and a second position, said adjusting means comprising a movable operative member operatively affixed to said frame and a linkage operatively interconnected between said movable member and said first and second support portions for hingedly moving said support portions between said first and second positions, said support portions being constructed and arranged to be at a relative angular position on said frame with said first support portion being inclined downwardly toward the ground for facilitating loading and unloading of objects to be supported thereon, when insaid first position, and to be in supporting alignment, for said objects, with both said support portions being in a substantially level position.

4,222,699

TOOL SUPPORTING ARM AND MOUNTING PLATE WITH A PLURALITY OF QUICK DISCONNECT MOUNTS FOR MULTIPLE ARMS

Robert E. Dunn, Catonsville, Md., and Edward H. Smith, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1978, Ser. No. 960,363
Int. Cl.[2] B25J 9/00
U.S. Cl. 414—750 6 Claims



1. Remotely operated multiple tool support apparatus comprising:

plate means for support on a remotely operated variably positionable table, said plate means having means for supporting a plurality of remotely operated tools, said last named means comprising:

a plurality of cylindrical sleeve members secured to said plate means with the axis of each member being horizontal and projecting radially from said plate means;

a plurality of tool supporting arms, each arm having a remotely operated tool on one end and an opposite end configured to be generally tightly telescopically received in said sleeve member; and

wherein said member and said arm have cooperating indexing means for positioning said tool in a vertically oriented position when said arm is properly received within said sleeve; and,

means for releasably securing said opposite end of said arm within said sleeve member; wherein,

said supporting arms include an intermediate hinge means connecting said one end to said opposite end for movement of said one end in a vertical plane from an active axially horizontal position to an inactive lower position; and

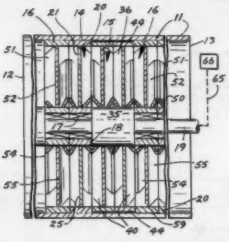
means for moving said one end between said two positions and maintaining said one end in said active position.

4,222,700

UNIDIRECTIONAL ROTATION TURBINE APPARATUS WITH REVERSE FLOW

Ronald P. Leuthard, Rte. 1, Box 292, Isanti, Minn. 55040

Filed Dec. 22, 1978, Ser. No. 972,523
Int. Cl.[3] F01D 25/28; F03B 3/04, 3/16
U.S. Cl. 415—7 9 Claims



1. Turbine apparatus comprising a tubular housing that is open at either axial end thereof, a shaft in the housing, a rotor assembly having the shaft extended axially therethrough and mounted in the housing for normal rotation in one angular direction about an axis rotation, the rotor assembly having a rotor hub and a plurality of circumferentially spaced blades extending radially outwardly of the rotor hub, a first stator assembly adjacent and on one axial side of the rotor assembly that includes a first stator hub and a plurality of circumferentially spaced stator blades extending radially outwardly of the first stator hub, and a second stator assembly adjacent and on the axially opposite side of the rotor assembly that includes a second stator hub and a plurality of circumferentially spaced stator blades extending radially outwardly of the second stator hub, each of the first stator blades in the angular direction of the normal rotation of the rotor assembly being inclined at about the same angle relative to a plane perpendicular to the axis of rotation of the rotor assembly and that passes through the first stator blades, and each of the second stator blades in the angular direction of normal rotation of the rotor assembly being inclined at about the same angle relative to a plane perpendicular to the axis of rotation of the rotor assembly and that passes through the second stator blades, the angle of inclination of the first stator blades being about equal and opposite to the angle of inclination of the second stator blades, the rotor blades having radially extending first leg portions axially adjacent the first stator assembly that in the angular direction of normal rotation of the rotor assembly are inclined at about the same angle relative to a plane perpendicular to the axis of rotation of the rotor assembly and that passes through the rotor blades, the angle of inclination of the first leg portions relative

the last mentioned plane being in the same direction as the angle of inclination of the first stator blades relative the first mentioned plane, each rotor blade being of a generally V trough shape and having a vertex and a second leg portion joined to a first leg portion at the vertex, said plane that passes through the rotor blades passing through the rotor blade vertexes and the second leg portions being inclined relative the last mentioned plane at angles about equal and opposite the angles of inclination of the first leg portions relative the same plane.

4,222,701

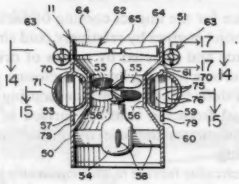
PUMP MODULE FOR A COMPLIANT UNDERWATER PIPE SYSTEM

Scott C. Daubin, 115 Sunrise Dr., Key Biscayne, Fla. 33149

Division of Ser. No. 717,352, Aug. 24, 1976, Pat. No. 4,116,009. This application Aug. 4, 1978, Ser. No. 930,973

Int. Cl.³ E02B *9/00*

U.S. Cl. 415—7 **5 Claims**



1. A pump module for a compliant underwater pipe system comprising a housing having an inlet and an outlet, a pump mounted in said housing for pumping fluid through said housing from said inlet to said outlet, torque and horizontal translation control means secured to said housing for controlling torques and movement of said housing effected by said pump, further torque control means secured to said housing for controlling residual torques created by said pump, means for connecting said housing to a compliant water pipe in substantial axial alignment thereto and buoyancy control means for controlling the axial stress of said pump module on said compliant pipe.

4,222,702

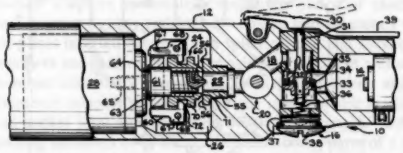
DECELERATION SENSITIVE AIR TOOL SHUTOFF

Earl E. Rush, Mentor, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 25, 1978, Ser. No. 945,607

Int. Cl.³ F01D *25/06*

U.S. Cl. 415—25 **10 Claims**



1. A speed responsive air shutoff mechanism for a pneumatic rotary tool having a throttle valve and an air motor comprising, in combination, a main air valve operably disposed between said throttle valve and said air motor and means interconnected with said main valve for opening said main valve in response to a predetermined level of instantaneous speed and acceleration and for closing said main valve in response to a predetermined lower level of instantaneous speed and deceleration.

4,222,703

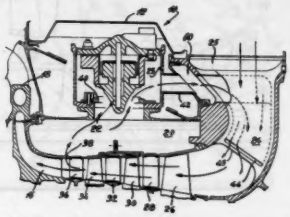
TURBINE ENGINE WITH INDUCED PRE-SWIRL AT COMPRESSOR INLET

Hans H. Schaum, St. Bruno; Donald J. Tedstone; Ching-Yee Ma, both of St. Lambert, and John J. Sanderson, St. Bruno, all of Canada, assignors to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Filed Dec. 13, 1977, Ser. No. 860,055

Int. Cl.³ F01D *1/12*; F04D *29/54*

U.S. Cl. 415—53 R **1 Claim**



1. An apparatus for providing an induced pre-swirl at the compressor inlet of a turbine engine comprising a multi-stage compressor, a housing for the compressor, bleed ports provided in the compressor housing interstage of the compressor, a plenum chamber in which the bleed air from the bleed ports is collected, control valve means for selectively passing the bleed air to a plurality of hollow vanes provided in the inlet of the compressor, each of the hollow vanes being connected to the control valve means by conduit means, each vane having a slot provided near the trailing edge of the vane and parallel with the trailing edge, a curved aerodynamic deflector having a concave surface and a convex surface in the slot for deflecting a major portion of the bleed air at an angle to the direction of air flow, a discharge opening being provided on the convex side of the deflector to allow attached flow about the deflector.

4,222,704

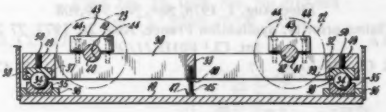
ROLLER SUPPORT FOR A LIFT PUMP

Robert A. Reid, Charlton City, Mass., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Filed May 31, 1979, Ser. No. 44,239

Int. Cl.³ F03B *3/12*

U.S. Cl. 415—72 **9 Claims**



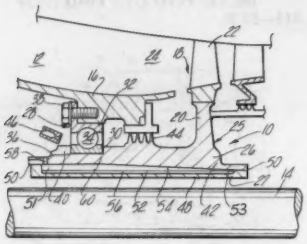
7. In a cylindrical lift pump for liquids, sewage and the like having an elongated cylindrical housing, a screw fixed within the housing and support means on at least one end thereof for rotatably maintaining said pump in a selected axial position and means for rotating said cylindrical housing, a roller bearing support for cooperating with said support means for maintaining said pump in a selected inclined position, said roller bearing support comprising an elongated carriage extending transversely of said pump, a pair of spaced axially aligned rollers on said carriage, a fixed base support, means at each end of said carriage for pivotally supporting said carriage on said base support, the end portions of said carriage being capable of deflection one relative to the other and about the central longitudinal axis of the carriage whereby said rollers will shift in planes substantially normal to the carriage and intersecting the roller shafts and thus maintain substantially line contact with said cylindrical lift pump housing.

4,222,705

BEARING MOUNTING WITH COOLING MEANS

Raymond Smith, Monclova, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 19, 1979, Ser. No. 21,797
Int. Cl.[3] F01D 5/08
U.S. Cl. 415—114 12 Claims



1. A mounting for a bearing means comprising:

a housing coaxially connected to a rotating shaft means;

bearing means being operatively disposed between a relatively stationary member and a first axial end of said housing;

heat sink means connected to the other axial end of said housing; and

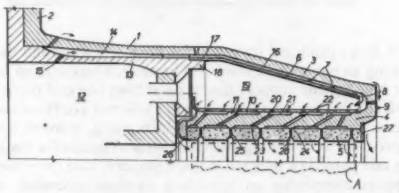
fluid passage means extending between said ends of said housing, said fluid passage means including an annular outer wall portion which tapers radially inwardly from the first end of said housing to the second end of said housing, said fluid passage means being at least partly filled with a liquid.

4,222,706

POROUS ABRADABLE SHROUD WITH TRANSVERSE PARTITIONS

Michel R. Ayache, Epinay sous Senart; Pierre A. Glowacki, Melun, and Gerard M. F. Mandet, Epinay sous Senart, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Aug. 1, 1978, Ser. No. 929,908
Claims priority, application France, Aug. 26, 1977, 77 26638
Int. Cl.[3] F01D 11/08
U.S. Cl. 415—116 10 Claims



1. In a housing for a jet engine having turbine blades in said housing and a ring including an abradable portion of a sintered porous material surrounding said turbine blades and wherein said ring is cooled by transpiration of air therethrough, the improvement comprising:

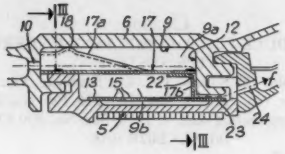
said ring being provided with partitions within the material of the ring and extending therethrough transverse to the axis of said rotor.

4,222,707

DEVICE FOR THE IMPACT COOLING OF THE TURBINE PACKING RINGS OF A TURBOJET ENGINE

Jacques L. Drouet, Dammarie les Lys, and Marcel J. Tournere, Paris, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jan. 22, 1979, Ser. No. 5,076
Claims priority, application France, Jan. 31, 1978, 78 02610
Int. Cl.[3] F02C 7/12
U.S. Cl. 415—116 13 Claims



1. In a device for the impact cooling of packing rings of the turbine of turbojet engines by relatively cold air issuing from an upstream source and directed by means of orifices in a radial flange of the turbine housing into an enclosure concentric with said rings and defined by the turbine housing and perforated plates separated from the external surface of the rings by a space communicating with the jet of motive fluid, the improvement comprising:

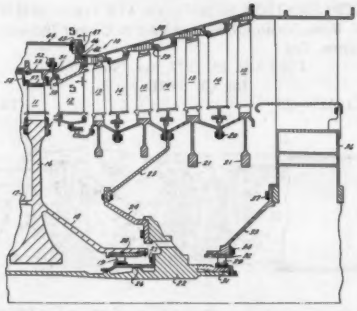
a generally circular ferrule in said enclosure and dividing the same into two chambers, with one of the chambers being defined by the ferrule and the turbine housing and supplied with cooling air by some of said orifices, and the other chamber being defined by the ferrule and the perforated plates and supplied with cooling air by the other of said orifices.

4,222,708

METHOD AND APPARATUS FOR REDUCING ECCENTRICITY IN A TURBOMACHINE

Samuel H. Davison, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jun. 26, 1978, Ser. No. 919,534
Int. Cl.[2] F01D 25/28
U.S. Cl. 415—127 15 Claims



1. An improved turbomachine structure of the type having a bearing supported rotor and a surrounding frame supported shroud which is susceptible to eccentricity with respect to the bearing wherein the improvement comprises:

(a) a first frame element having outer and inner annular surfaces with centers that are relatively radially offset by a first predetermined distance;

(b) a second frame element having outer and inner annular

surfaces with centers that are relatively radially offset by a second predetermined distance; and

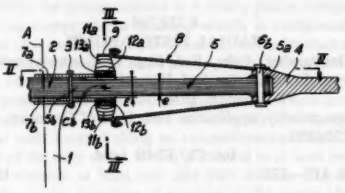
(c) means for relatively rotating said first and second frame elements to selected positions so as to substantially reduce any existing eccentricity between the shroud and the bearing.

4,222,709

VARIABLE-PITCH ROTOR, SPECIALLY FOR A ROTARY-WING AIRCRAFT

René L. Mouille, Aix-en-Provence, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 10, 1978, Ser. No. 923,433
Claims priority, application France, Jul. 13, 1977, 77 21658
Int. Cl.[3] B64C *27/38*
U.S. Cl. 416—134 A **1 Claim**



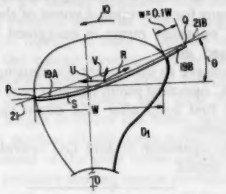
1. A variable pitch rotor, specially for a rotary-wing aircraft, comprising a hub, at least one blade and one elongate connecting member, connecting said blade to said hub, said connecting member comprising a substantially radial bundle of fibres having high mechanical strength, each fibre being agglomerated by a resin and secured to the other fibres by a vulcanized elastomer, so that said connecting member is sufficiently flexible to be deformed, to permit beat and drag movements of the blade and variations in its pitch, at least one rigid tubular sleeve disposed in a spaced and surrounding relationship to said connecting member, the outer end of said sleeve being secured to the root part of the blade, a rigid ring which is secured to the inner end of said sleeve and to which a blade pitch control level is externally articulated, spherical ball and socket joint members inserted between said rigid ring and rigid parts of said hub, and frequency adaptors, each associated with one of said ball and socket joint members, said ball and socket joint members essentially consisting of laminated elastomer, said frequency adaptors essentially comprising plates of elastomer having great rigidity and high hysteresis, said frequency adaptor plates inserted between said spherical ball and socket joint members and said rigid parts of said hub, said ball and socket members essentially comprising laminated elastomer and said frequency adaptor plates respectively incorporated in said ball and socket joint members, said bundles of fibres of said connecting members of at least two blades being parts of a single bundle of fibres having at least one intermediate part incorporated in the rotor hub, the thickness of said hub perpendicular to the rotor plane being slightly greater than the thickness of said connecting members, and the rigid parts of the hub bearing said spherical ball and socket joint members being rigid metal plates, which are secured to the top and bottom surfaces of the hub respectively, and which extend radially in a spaced relationship to both faces of each elongate radial connecting member over a predetermined fraction of the length of said connecting member.

4,222,710

AXIAL FLOW FAN HAVING AUXILIARY BLADE

Haruo Katagiri; Kenji Fujikake, and Katsuhito Yamada, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Dec. 19, 1977, Ser. No. 861,972
Claims priority, application Japan, Dec. 20, 1976, 51-153067
Int. Cl.[2] F04D *29/38, 29/58*
U.S. Cl. 416—236 A **26 Claims**



1. An axial flow fan having at least one auxiliary blade comprising:

a hub member rotatably supported and driven by a drive source;

a plurality of primary blades having a predetermined angle with respect to the rotational direction thereof and a predetermined width and height, said primary blades being radially provided on said hub member and each including a leading edge; and

at least one auxiliary blade disposed on at least one of a suction and pressure surface of said primary blades, and extending beyond an end portion of a trailing edge of said primary blade, said auxiliary blade extending substantially within a predetermined length in a width direction of said primary blade on said surface thereof, a leading edge of said auxiliary blade being positioned closer to an axis of the fan than a trailing edge of said auxiliary blade and beginning at a position corresponding to or trailing the leading edge of said primary blade,

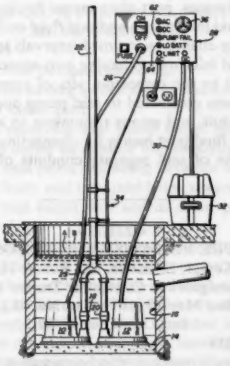
whereby a radial flow is increased by said extending portion of said auxiliary blade.

4,222,711

SUMP PUMP CONTROL SYSTEM

Thomas J. Mayer, Phoeniz, Ariz., assignor to I[2]DS, Elk Grove Village, Ill.

Filed Jun. 22, 1978, Ser. No. 917,858
Int. Cl.[3] F04B *49/00, 49/06*
U.S. Cl. 417—7 **6 Claims**



1. Apparatus for pumping liquid from a sump or the like to

maintain the liquid surface below a predetermined level, comprising

an AC operated pump positioned in said sump,

a DC operated pump positioned in said sump,

control means responsive to the level of said liquid in said sump for energizing said AC operated pump when said surface is at a first level and for energizing said DC operated pump when said AC operated pump is unable to pump water from said sump at a flow rate not less than the rate at which water is entering said sump,

counter means for providing a count of the number of times said AC operated pump is energized and subsequently deenergized, and

means responsive to said count for causing the energization of said DC operated pump the next time said liquid surface is at said first level after said count reaches a predetermined number,

whereby the operation of said DC operated pump is intermittently tested.

4,222,712

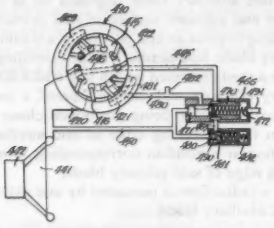
MULTIPLE DISPLACEMENT PUMP SYSTEM WITH BYPASS CONTROLLED BY INLET PRESSURE

Melvin F. Huber, and Lowell D. Hansen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 666,774, Mar. 15, 1976, Pat. No. 4,102,606, which is a division of Ser. No. 470,988, May 17, 1974, Pat. No. 3,953,153. This application Feb. 15, 1978, Ser. No. 878,010

Int. Cl.[2] **F04B** *23/10, 49/00*

U.S. Cl. 417—204 **5 Claims**



1. A multiple displacement pump system including a vane pump having a housing with means defining a rotor chamber having walls and a rotor carrying a plurality of vanes movable in a pumping path in said rotor chamber between fluid inlet means and fluid outlet means with a first set of pumping chambers between said vanes and the walls of said rotor chamber and a second set of pumping chambers beneath and radially inward of said vanes, port plate means having ports for connecting said fluid inlet means and said fluid outlet means to said sets of pumping chambers at timed intervals in rotation of the rotor, said fluid inlet means having two separate conduits for supplying fluid to the respective sets of pumping chambers, and circuit means connected to said pump and having a fluid utilization conduit, and means responsive to a predetermined pressure in the fluid inlet means for connecting the fluid outlet means with one of said separate conduits of the fluid inlet means.

4,222,713

TEMPERATURE RESPONSIVE FUEL COMPENSATOR

Richard A. DeKeyser, Edelstein, and Robert H. Miller, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 29, 1979, Ser. No. 43,182

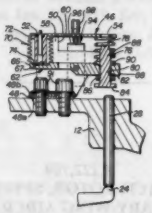
Int. Cl.[3] **F04B** *49/00*

U.S. Cl. 417—214 **7 Claims**

1. A temperature responsive fuel compensator apparatus (30) comprising:

a first member (70), said first member being temperature responsive for movement in a first direction in response to a temperature increase;

a second member (76), said second member being resiliently biased in said first direction; and



means (62) for moving said second member (76) in a second direction opposite said first direction in response to movement of said first member (70) in said first direction, said means (62) interconnecting said first and second members (70,76).

4,222,714

RADIAL PISTON PUMP

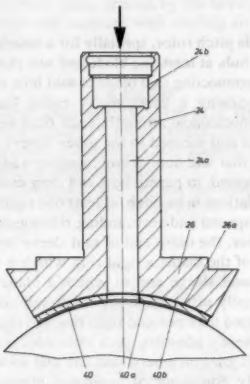
Jörg Dantlgraber, Lohr, Fed. Rep. of Germany, assignor to Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 894,017

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716890

Int. Cl.[3] **F04B** *1/04*

U.S. Cl. 417—273 **13 Claims**



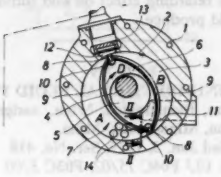
1. A radial piston pump, comprising a housing; a shaft mounted for rotation in said housing and including an eccentric provided with a camrack; inlet and outlet ports in said housing; valve means installed in said ports; a plurality of radially reciprocable pistons spaced about said eccentric and each having a radially inner base portion with a radially inner surface facing toward said cam track; and a sheet member secured to said radially inner surface of said base portion of each of said pistons and provided with a relatively thin layer of a synthetic plastic material having a low coefficient of friction and being in sliding engagement with said cam track, said cam track of said eccentric of said shaft having a peak-to-valley height at most equal to 4μ so as to provide for optimum sliding of said cam track and said layer relative to one another and low wear of the same, said sheet member having a thickness equal to substantially 1 mm so that it is readily deformable and provides for well fitting to said radially inner surface of said base portion and securing to the latter.

4,222,715

DEVICE FOR DELIVERY CONTROL IN A ROTARY PISTON COMPRESSOR

Max Ruf, Obereisesheim, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1979, Ser. No. 12,760
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807301
Int. Cl.[3] F04B 49/00
U.S. Cl. 417—310 4 Claims



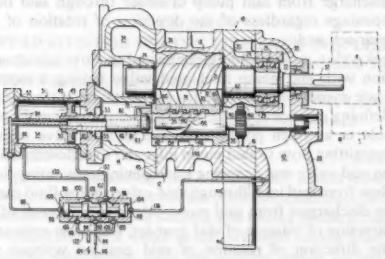
1. A device for power control in a rotary piston compressor of the form comprising a housing which is composed of a jacket and two parallel side parts and has an outlet duct and at least one lateral inlet duct, and a piston which is mounted on an eccentric of an eccentric shaft, and which, in rotation, defines with the inner jacket area, working chambers which are variable in volume and which, with its circumferential edges, or with axial seals located along its circumferential edges, overrides one of the inlet ducts which is located in at least one side part, and wherein at least one side part defines at least one recess lying in the direction of rotation of the piston after the inlet duct, a withdrawable plug being disposed within the recess so that it is flush in its closed position with the side wall, such that, when the plug is withdrawn the recess enables one of the working chambers which is in the compression cycle to communicate with the inlet duct through a hollow space provided in the piston during sliding of the edges of the circumference of the piston or the axial seals over the recess.

4,222,716

COMBINED PRESSURE MATCHING AND CAPACITY CONTROL SLIDE VALVE ASSEMBLY FOR HELICAL SCREW ROTARY MACHINE

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jun. 1, 1979, Ser. No. 44,433
Int. Cl.[3] F04B 49/02
U.S. Cl. 417—310 4 Claims



1. In a positive displacement helical screw rotary machine for functioning either as a compressor or an expander and including a casing provided with a barrel portion defined by intersecting bores, with coplanar axes located between axially spaced end walls and having inlet and outlet ports in communication with the bores at opposite ends, helical screw rotors each having grooves and lands being mounted for rotation within respective bores with the lands and grooves of respective rotors intermeshed, an axially extending recess provided within the barrel portion of the casing in open communication with said bores and a slide valve member mounted for axial sliding within the recess with the inner face of the slide valve member being complementary to the envelope of that portion of the bores of the casing structure confronted by the opening of the recess and with the slide valve member communicating the bore portion of the casing structure with the slide valve member in sealing relation with the confronting rotor structure, the outlet port having at least a portion located in the barrel portion of the casing structure, with the slide valve member being movable between extreme positions in which the outlet port is open and closed, said slide valve member being of sufficient length to cover the entire remaining length of the confronting portion of the rotor structure throughout the range of movement of the slide valve member between its extreme positions, pressure sensing means provided adjacent to the end of the slide valve member closing off the outlet port to the closed thread for sensing the pressure of the working fluid within the closed thread just upstream from the outlet port, means for comparing the pressure of the outlet port to the closed thread pressure at said outlet port, and means for automatically shifting the slide valve axially to equalize these pressures to prevent undercompression or overcompression of the working fluid when the unit is functioning as a compressor and for preventing underexpansion or overexpansion of the working fluid when the unit is functioning as an expander to maximize machine efficiency in respective modes, the improvement residing in an axial bore within the slide valve member, a plurality of longitudinally spaced overflow channels in the slide valve member inner face communicating the inner face partially defining the envelope of the intermeshed screw rotors to said axial bore and means communicating the axial bore to the inlet port of said machine, a cylindrical volumetric capacity control valve body movably disposed within said slide valve member bore in sealing fashion therewith and including means responsive to shifting of the valve body for selectively covering and uncovering the overflow channels and communicating the slide valve member bore to the working chamber bearing the intermeshed helical screw rotors, and means for effecting control movement of said valve body relative to said valve member bore.

4,222,717

FUEL INJECTION PUMP

Jerry A. Clouse, Washington, and Richard A. Dekeyser, Edelstein, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 6, 1978, Ser. No. 949,317
Int. Cl.[3] F02M 59/26
U.S. Cl. 417—499 5 Claims

1. A fuel injection pump, comprising:

(a) a pump barrel having a central bore and a radial inlet port and a radial outlet port;

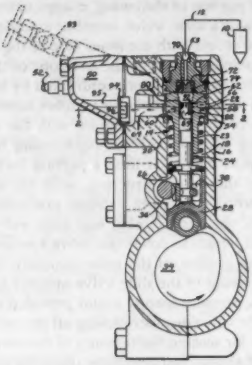
(b) a housing receiving said pump barrel and cooperating therewith to define an annular fuel receiving cavity about said barrel, said ports extending between said cavity and said central bore, said inlet port being spaced circumferentially from said outlet port and directed generally oppositely thereof;

(c) a plunger received by said pump barrel bore and having a surface at one end for selective registration with said ports, said plunger cooperating with said pump barrel and said housing to form a fuel injection chamber;

(d) a fuel supply and deaeration chamber in said housing spaced from one side of said pump barrel generally oppositely of said inlet port; and

(e) a pair of fuel conduits in said housing extending between said annular cavity and said fuel chamber, one of said fuel

conduits being linearly aligned with and adjacent to said outlet port and said fuel chamber and the other of said



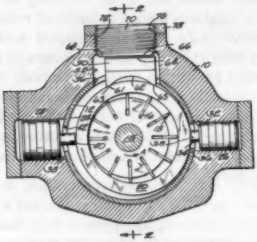
conduits communicating with said annular cavity without alignment with either of said ports.

4,222,718

LINEAR MOTION THRUST BLOCK FOR HYDRAULIC PUMPS AND MOTORS

Gregory D. Lemke, Racine, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Mar. 9, 1978, Ser. No. 884,924
Int. Cl.[3] F03C *2/00*; F04C *15/04*
U.S. Cl. 418—26 **7 Claims**



1. A thrust block assembly for a hydraulic pump or motor having a casing defining a chamber for receiving a rotor and a cam ring surrounding said rotor, said cam ring radially movable relative to the axis of said rotor in response to pressures generated within said pump or motor during the operation thereof; said thrust block comprising:

an outer block having external screw threads and rotatably mounted within said casing on matching internal threads of a bore through said casing into said chamber, said outer block having a planar, inner surface positioned generally parallel to a plane tangential to said rotor and radially adjustable relative to said rotor axis during the operation of said pump or motor by rotation of said outer block external to said casing, and

an inner block freely movable within said bore and interposed between said outer block and cam ring, said inner block having a planar, outer surface positioned generally parallel to a plane tangential to said rotor determined by said radial adjustment of said outer block and in sliding contact with said inner surface of said outer block and having an inner surface in contact adjustable during the operation of said pump or motor with the outer periphery of said cam ring to position said cam ring relative to said rotor axis in the directions parallel to the axis of said outer block, so that

substantial movement of said cam ring relative to said rotor axis during the operation of said pump or motor is prevented in the direction of said thrust block by said contact between said inner block and cam ring and facilitated in the directions parallel to said planar surfaces of said inner and outer blocks by said sliding contact therebetween enabling said inner block to slide across said outer block when said cam ring moves in said parallel directions, and

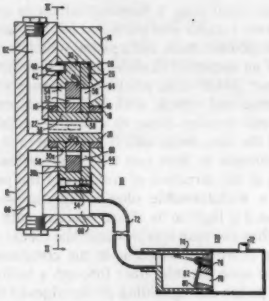
a substantially planar layer of antifriction material bonded to one of said planar surfaces of said inner and outer blocks to reduce the retarding effect on said sliding contact that friction would produce.

4,222,719

REVERSIBLE UNIDIRECTIONAL FLUID FLOW PUMP

Sigvold O. Johnson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 2, 1979, Ser. No. 418
Int. Cl.[2] F04C *15/02*; F03C *3/00*
U.S. Cl. 418—32 **5 Claims**



1. In combination:

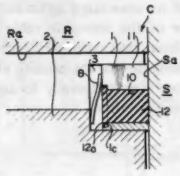
a unidirectional flow liquid pump having a pump chamber with inlet and outlet openings and enclosing a reversible rotatable gear-set means for positively displacing liquid from between converging meshing teeth of said gear-set means and wherein one gear of said gear-set means is rotated on an axis eccentric from the other gear of said gear-set means, and a movable member annular said gear-set means and reversibly rotatable through an arc of approximately 180° for positioning the axis of said one gear relative to the axis of said other gear to maintain liquid discharge from said pump chamber through said outlet openings regardless of the direction of rotation of said gear-set; and

check valve means serially connected in flow communication with said pump inlet, said valve having a movable plate member disposed adjacent a stationary valve seat defining a valve opening therein, said plate member movable to an open position relative to said valve opening permitting flow to said pump inlet and to a closed position on said valve seat covering said opening preventing liquid flow from said inlet through said valve so that fluid cannot be discharged from said pump inlet upon reversal of the direction of rotation of said gear-set, and upon reversal of the direction of rotation of said gear-set without said annular member rotating to a position to maintian the discharge through the pump outlet said valve means establishes a hydraulic lock between the gears of said gear-set which in turn, under continued rotation of said gear-set, moves said annular member to said position to reestablish the discharge from said pump chamber through said outlet.

4,222,720
CORNER SEAL MEANS FOR ROTARY PISTON ENGINES

Kazuma Shimizu; Yoshitaka Nomoto, and Shisou Kariyama, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 22, 1978, Ser. No. 935,858
Claims priority, application Japan, Aug. 24, 1977, 52/113650[U]
Int. Cl.³ F01C *19/10*
U.S. Cl. 418—121 7 Claims



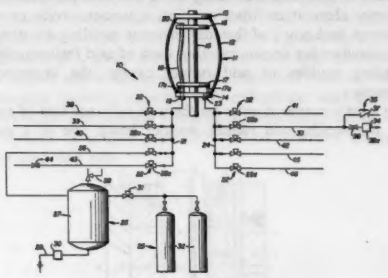
1. Rotary piston engine comprising a casing which has an inner peripheral wall surface of trochoidal configuration and a pair of opposed inner side wall surfaces, a substantially polygonal rotor disposed in said casing and having apex portions adapted to be slidably engaged with the inner peripheral wall surfaces and opposite side surfaces confronting with the inner side wall surfaces of the casing, said rotor being formed at each apex portion with an axially extending seal groove for receiving an apex seal and at each side surface with a cylindrical recess located adjacent to each apex portion for receiving a corner seal having a cylindrical outer surface, said seal groove being continuous with the recess at each end of the seal groove, said corner seal having an axially extending bore which is offset in one radial direction with respect to longitudinal axis of the cylindrical outer surface of the corner seal and an axially extending slit which is formed to extend from the bore radially to the outer surface of the corner seal at the side opposite to the direction of the offset of said bore, said bore and slit being adapted for receiving an adjacent end of the apex seal with gaps therebetween, filler means of non-rigid material disposed in said gap between the bore in the corner seal and the apex seal for preventing gas leakage through said last-mentioned gap, and means for restricting movement of the filler means with respect to the corner seal toward the adjacent inner side wall of the casing.

4,222,721
APPARATUS FOR CURING TIRES AND THE LIKE

Victor C. Gado, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 652,199, Jan. 26, 1976, Pat. No. 4,126,657. This application Sep. 8, 1978, Ser. No. 940,625
Int. Cl.² B29H *5/02*
U.S. Cl. 425—33 4 Claims

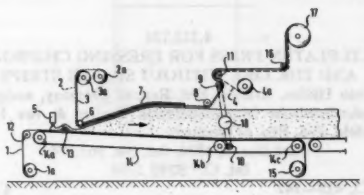
1. Apparatus for curing tires and the like, within separable molds having a center mechanism positioned therein, comprising means for introducing shaping and curing fluids, including high temperature hot water as the principal curing fluid into said center mechanism, inert gas purging means for purging said high temperature hot water from said center mechanism prior to the introduction of cold water into said center mechanism, and means for then introducing cold water into said center mechanism for cooling of said tires or the like preparatory to the removal thereof from said molds, whereby mixing of said hot water and said cold water and resultant loss of temperature in said hot water is substantially avoided without omitting or significantly foreshortening said cold water cooling necessary to insure quality of said tire or the like and to prevent deformation thereof.



4,222,722
DEVICE FOR SYNCHRONIZING THE MOVEMENT OF THE COVER WEB AND BASE WEB DURING THE CONTINUOUS PRODUCTION OF RECTANGULAR FOAM BLOCKS

Horst Bokelmann, Bad Wildungen, Fed. Rep. of Germany, assignor to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 23,729
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813137
Int. Cl.² B29D *27/04*
U.S. Cl. 425—89 4 Claims



1. Device for synchronizing the movement of the cover web and base web during continuous production of rectangular foam blocks, comprising means for producing a rising foamable polyurethane reaction mixture, a belt for transporting the reaction mixture, the base web being disposed between the reaction mixture and said belt, the cover web being disposed above the rising foam, deviating means for pulling the cover web from the foam at substantially the point where the foaming is completed, a deviating roller for guiding the cover web after removal from the foam, means coupled to said belt for driving said deviating roller with a circumferential speed which is synchronized with the forward speed of said belt, and a vertically adjustable pressure roller adjacent to said deviating roller for guiding and preventing slippage of the cover web on said deviating roller.

4,222,723
MOLDS FOR INJECTION MOLDING OF CONTINUOUS SLIDE FASTENER CHAIN

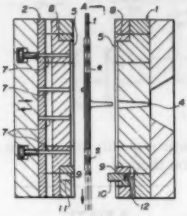
Mitsuo Sawada, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Jul. 3, 1979, Ser. No. 54,422
Claims priority, application Japan, Jul. 4, 1978, 53-92717
Int. Cl.² B29D *5/00*; B29F *1/06*
U.S. Cl. 425—116 2 Claims

1. In combination with molds for the injection molding of

continuous slide fastener chain, of the type wherein the molds for the injection molding of continuous slide fastener chain include at least one stationary mold and two parallel rows of fastener element molding cavities, a runner cavity provided between said rows of fastener element molding cavities, and gate cavities for communicating each of said fastener element molding cavities to said runner cavity, the improvement wherein:

at least a runner stopper on the tape entrance side of each of the molds, said runner stopper being one of a pair of



runner stoppers each located at the respective ends of said runner cavity in said molds, has a trapezoidal portion whose width gradually diminishes toward the interior of said runner cavity; and

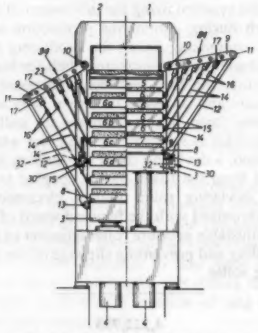
said stationary mold further includes adjacent to a runner stopper located on the tape exit side thereof a positioning stopper reducing its width toward the exterior of the mold and having a trapezoidal portion of a shape to engage with a trapezoidal recess formed in the posterior end of a runner by the recessed portion of said runner stopper on the tape entrance side.

4,222,724

MULTI-PLATEN PRESS FOR PRESSING CHIPBOARDS AND THE LIKE WITHOUT SPACER STRIPS

Kurt van Hüllen, Krefeld, Fed. Rep. of Germany, assignor to Niederrheinische Maschinenfabrik Becker & van Hüllen, Krefeld, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,774
Int. Cl.³ B29J *5/08*
U.S. Cl. 425—141 **1 Claim**



1. A multi-platen press without spacer strips between individual press plates for pressing chipboard comprising:

a stationary upper press table;

a rectangular movable lower press table having four corners;

a plurality of movable platens interposed between said upper and lower press tables, said platens being adapted to receive material between them for pressing chipboards;

at least one press cylinder on each of the four corners of said movable press table, said cylinders being operable to raise the movable press table toward said stationary press table;

a separate control device associated with each of said cylinders to regulate the length of stroke of each cylinder so that all of the cylinders have precisely equal-length strokes, each of said control devices being mounted on the press adjacent the corner of said movable table to which its respective cylinder is connected, and each of said control devices being independently adjustable toward or away from said stationary upper press table, said control devices each being actuated by said movable table to stop the operation of its associated cylinder when the corresponding corner of the movable table reaches a preselected distance from said stationary table; and

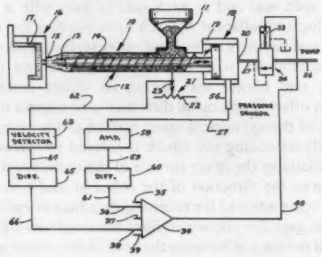
a simultaneous closing device for causing all of said plurality of platens to close simultaneously to equidistant spacing with regard to one another.

4,222,725

ELECTRO-HYDRAULIC RAM CONTROL APPARATUS

John L. Rodgers, Jr., Mound, Minn., assignor to Solid Controls, Inc., Minneapolis, Minn.

Continuation of Ser. No. 620,809, Oct. 8, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,477
Int. Cl.³ B29F *1/00, 1/06*
U.S. Cl. 425—145 **3 Claims**



1. In combination, a hydraulic injection molding press of the class having a hydraulically actuated cylinder connected to a ram for transferring molding material from a chamber into a mold and including a source of pressurized hydraulic fluid having a pressure relief valve and connected directly to the cylinder, and a controller for controlling operation of the molding press, the controller comprising

(a) a controllable transducer operating the pressure relief valve to control hydraulic fluid pressure in the cylinder;

(b) ram velocity control means comprising means sensing the velocity of the ram as it moves in an injection stroke and means comparing the sensed velocity with a preset velocity and producing a deviation signal controlling the pressure relief valve transducer to thereby control the ram velocity;

(c) holding pressure control means comprising sensing means sensing the hydraulic cylinder pressure, means comparing the sensed pressure with a preset value and producing a deviation signal controlling the pressure relief valve transducer to control the hydraulic cylinder pressure; and

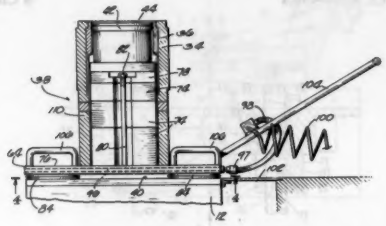
(d) sensing and switching means sensing when a mold has been substantially filled with molding material and responsively switching control of the pressure relief valve transducer from the velocity control means to the pressure control means.

4,222,726

BRICK PRESS INCLUDING A REMOVABLE PLUNGER ASSEMBLY AND METHOD FOR REMOVING THE PLUNGER ASSEMBLY

William T. Savage, Lemont, Ill., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 4, 1978, Ser. No. 965,783
Int. Cl.[3] B29C 1/16; B28B 7/00, 17/00
U.S. Cl. 425—195 12 Claims



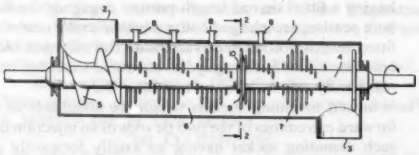
1. A press for use in shaping refractory material and including a bed having a planar surface, a frame attached to the bed and including at least a pair of columns, a mold table supported by the columns for movement toward and away from the bed, a mold box releasably supported by the mold table, the mold box including at least one mold cavity, and means for selectively transferring the mold box into and out of the press and for providing for substitution of an alternative mold box, the transferring means including a planar pallet supportable by said planar surface of said bed, said mold box being supported by said pallet when said mold box is released from said mold table, at least one plunger supported by said pallet and adapted to be received in said mold cavity, and means for selectively supporting said pallet on said planar surface of said bed for slidable movement into and out of said press, said supporting means including means for selectively forming an air cushion between said pallet and said bed planar surface.

4,222,727

APPARATUS FOR PRODUCING GRANULES FROM FINE POWDER

Ryoichi Adachi, Ichihara, and Toshihito Hayashi, Ichihata, both of Japan, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1978, Ser. No. 970,077
Claims priority, application Japan, May 11, 1978, 53-062190
Int. Cl.[2] B29G 7/00
U.S. Cl. 425—222 10 Claims



1. An apparatus for the preparation of granules from fine powder comprising:

a cylindrical housing including a cylindrical wall portion defining a longitudinal axis, a cylindrical granulation chamber symmetrically disposed about said axis, a longitudinally spaced entrance and exit disposed at opposite ends of said housing respectively and at least one inlet to said chamber for supply of a binder thereto;

a shaft extending longitudinally through said granulation chamber coaxially with and mounted for rotation about said axis;

a plurality of stirring pins fixedly attached to said shaft to project generally radially therefrom in spaced apart relationship along said axis substantially throughout the longitudinal extent of the granulation chamber; and

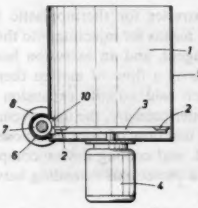
obstruction means mounted on said shaft and extending generally normal to said axis to close a generally circular portion of a transverse cross-section of said granulation chamber and to define with the cylindrical wall portion an annular opening adjacent said cylindrical wall portion, whereby said annular opening inhibits longitudinal conveyance of smaller less well formed granules therepast toward said exit.

4,222,728

APPARATUS FOR PROCESSING SYNTHETIC THERMOPLASTIC MATERIAL

Helmut Bacher, Linz, and Helmuth Schulz, St. Florian, both of Austria, assignors to Krauss-Maffei Austria Gesellschaft m.b.H., Asten, Austria

Filed Feb. 22, 1979, Ser. No. 14,083
Claims priority, application Austria, Mar. 2, 1978, 1475/78
Int. Cl.[2] B29B 1/00; B29F 3/00
U.S. Cl. 425—305.1 2 Claims



1. An apparatus for processing synthetic thermoplastic material, comprising

(a) an upright receiving container having a vertical axis, a side wall surrounding the axis, a bottom wall and an upper end opposite the bottom wall, the upper end being adapted to receive the synthetic thermoplastic material to be charged into the container, and

(1) the side wall of the container defining an opening near the bottom of the container,

(b) a disintegrating and blending means for the synthetic thermoplastic material mounted in the container to revolve about the axis substantially on the level of the opening, the revolving disintegrating and blending means

(1) including knife means and

(2) imparting to the material a centrifugal force causing the material to move radially outwardly through the opening, and

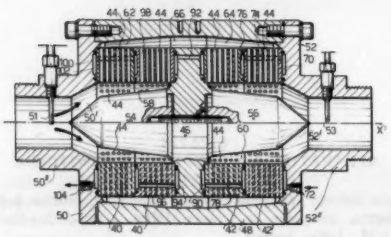
(c) a screw extruder including a housing and a screw conveyor mounted in the housing, the screw extruder extending tangentially to the side wall of the container and the housing of the screw extruder being connected to the side wall, the opening in the side wall being in communication with the interior of the housing whereby the outwardly moving synthetic thermoplastic material is fed to the screw conveyor by the centrifugal force through the opening in the side wall.

4,222,729

SCREW EXTRUDER FOR THERMOPLASTIC SYNTHETIC FOAMS

Franco Ragazzini, and Roberto Colombo, both of Turin, Italy, assignors to Lavorazione Materie Plastiche L.M.P. S.p.A., Turin, Italy

Filed Feb. 7, 1979, Ser. No. 10,285
Int. Cl.[2] B29F 3/08
U.S. Cl. 425—378 R 8 Claims



1. In a screw extruder for thermoplastic synthetic foam comprising a barrel, means for injecting into the barrel a liquid volatile expansion agent, and an extrusion head arranged to receive from the barrel a flow of molten thermoplastic synthetic resin in which said volatile expansion agent is thoroughly dispersed under pressure, the improvement comprising a device for cooling said flow of resin, interposed between said head and said barrel, said cooling device comprising:

a housing having a center axis extending between said head and said barrel;

metal block means adapted to be cooled mounted in said housing, having two opposed faces disposed parallel to said axis and at least one axially extending row of passages passing through said block from one to the other of said faces;

said passages being of substantially circular cross-section and a length/diameter ratio which does not exceed approximately 10:1;

an inlet manifold channel in said housing for the input of said flow to a first of said faces and an outlet manifold channel in said housing extending from the second of said faces;

said inlet manifold channel being directed at least substantially in the same direction as said axially extending row of passages and having one of its lateral walls formed by the first of said faces of the block, whereby the individual passages in said row branch off from said inlet manifold channel transversely to the direction of the latter and in sequence with regard to this direction;

said outlet manifold channel being directed at least substantially in the same direction as said axially extending row of passages and having one of its lateral walls formed by said second face of said block whereby the individual passages in said row open into the outlet manifold channel transversely to the direction of the latter and in sequence with respect to this direction; and

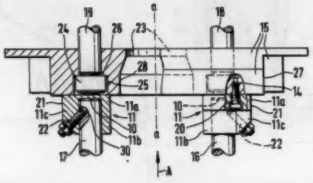
cooling channel means associated with said block means for cooling said block means by contact with a liquid refrigerant adapted to be carried in said channel means.

4,222,730

ARRANGEMENT FOR INTERCHANGEABLY MOUNTING DIFFERENT INJECTION UNITS ON AN INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,374
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837761
Int. Cl.[2] B29F 1/06
U.S. Cl. 425—450.1 8 Claims



1. In an injection molding machine which comprises a die closing unit with a longitudinal center axis along which the unit executes opening and closing movements and which has, as a part of said unit, a stationary die carrier plate extending transversely to the center axis, a movable die carrier plate and two die closing unit tie rods which are parallel to and equidistant from the center axis, extending forwardly from the stationary die carrier plate, to serve as guides for the movable die carrier plate, the tie rods having their rear extremities rigidly clamped to the stationary die carrier plate by means of preloaded tie rod connections, in such a machine, an arrangement in association with said preloaded tie rod connections for selectively and interchangeably mounting to the rear side of the stationary die carrier plate several axially oriented injection units of varying size, each having a pair of injection unit tie rods, the spacing of which is either equal to, larger, or smaller than the spacing of the two tie rods of the die closing unit, the mounting arrangement comprising in combination:

as part of said preloaded tie rod connections, two tie rod seating bores in the stationary die carrier plate, each seating bore having a fitted bore portion and, on the rear side of the plate, an enlarged recess bore portion forming an axially rearwardly oriented abutment shoulder around the fitted bore portion;

also as part of said tie rod connections, a matching end portion on each of the two tie rods of the die closing unit having a fitted tie rod length portion engaging the fitted bore portion, an enlarged collar member to the rear of the fitted length portion received inside the enlarged recess bore portion so as to engage its abutment shoulder, and a rearwardly oriented tie rod end face; and

two tie rod mounting sockets which are attachable to the forward extremities of the two tie rods of an injection unit, each mounting socket having an axially forwardly oriented clamping face which is clampable against the end face of one of the two die closing unit tie rods, thereby axially preloading its collar member against the abutment shoulder; and wherein

each mounting socket further includes fastener means engaging the mounting socket and the rear side of the die carrier plate on several attachment points around the associated tie rod seating bore, for the creation of such a clamping preload; and

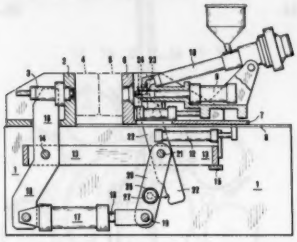
the two mounting sockets further include means for positioning and centering the two tie rods of the injection unit at the required tie rod spacing.

4,222,731

MOLDING PRESS FOR PLASTIC MATERIALS

Leo Enrietti, Via Perloz, Pont-Saint-Martin (Aosta), and Piero Enrietti, Via Roma 72, Donnaz (Aosta), both of Italy

Filed Dec. 12, 1978, Ser. No. 968,782
Claims priority, application Italy, Jan. 9, 1978, 67019 A/78
Int. Cl.[2] B29C *3/00*; B29F *1/06*
U.S. Cl. 425—451.5 8 Claims



1. A molding press for molding plastic materials, comprising a base, a stationary head fixed on said base, a movable head mounted on said base for reciprocating movement with respect to said stationary head, said stationary and movable heads being intended to receive the two parts of a mold, at least one longitudinal member installed in said base, at least one first elongated member on said longitudinal member, one end of said first member being connected to said stationary head, at least one second elongated member in the form of a rocker lever pivoted on said longitudinal member, one end of said second member being connected to said movable head, a hydraulic clamping piston-cylinder assembly having its ends connected to the other ends of said first and second members respectively, and an auxiliary closure piston-cylinder assembly of smaller cross section than the first-mentioned assembly and having its ends connected to said movable head and to said base respectively, at least one of said members being divided and comprising one portion connected to one of said heads and another portion connected to said clamping clylinder-piston assembly, and releasable rigid connection means between said two portions, whereby the approach and removal strokes are controlled with high speed and low force by said auxiliary closure piston-cylinder assembly when said rigid connection means is released, and the clamping stroke is controlled by said clamping cylinder-piston assembly with a high force exerted over a short distance when said rigid connection means is engaged.

4,222,732

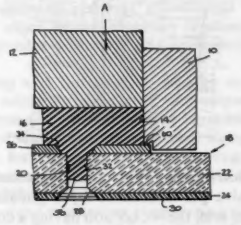
TRANSFER MOLDING INSULATION UNIT

Lambert M. Pasch, Aachen-Nuthelm, and Heinz Wagemann, Aachen, both of Fed. Rep. of Germany, assignors to Uniroyal Aktiengesellschaft, Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 554,279, Feb. 28, 1975, abandoned.
This application Nov. 3, 1978, Ser. No. 957,638
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1974, 2420723; Apr. 29, 1974, 2420724
Int. Cl.[3] B29F *1/06*
U.S. Cl. 425—544 25 Claims

1. An apertured insulation unit for interposition between a mold having at least one cavity in which elastomeric stock can be cured in the form of said cavity and an open ended chamber of an injection unit from which elastomeric stock can be expelled and transferred through said insulation unit to the cavity of said mold, said mold and injection unit being movable axially relative to one another into and out of pressing association with respective opposite side-faces of said insulation unit, said insulation unit serving to prevent curing of elastomeric stock remaining in said injection unit with the curing of a portion of said stock transferred to said cavity without separation of said mold or injection unit from said insulation unit, said insulation unit comprising a first plate constituted of a flexible thermal-insulatory material, and a second plate superposed upon and affixed to said first plate, at least said second plate having a projected area and configuration corresponding in size to and insertable into the open end of said chamber of said injection unit, said second plate being constituted of a different flexible material having a greater tensile strength and a lower capacity to resist heat-transfer than said first plate, said first and second plates each being multi-apertured and arranged such that each aperture in said first plate has a corresponding coaxially aligned aperture in said second plate and elastomeric stock is transferable through each aligned pair of such apertures, said second plate constituting means for reinforcing said first plate against buckling and deterioration in the vicinity of the coaxially aligned apertures of said plates.

8. An apertured insulation unit having opposite side-faces and adapted for interposition between (A) a mold having at least one cavity in which elastomeric stock can be cured in the form of said cavity and (B) an open ended chamber of an injection unit from which elastomeric stock can be expelled and transferred through said insulation unit to the cavity of said mold, with said mold and said injection unit being arranged for relative axial movement therebetween into and out of confining relation to said insulation unit at the respective opposite side-faces of the latter so as to enable the elastomeric stock in said chamber to be pressed against said insulation unit, and said insulation unit when so confined serving, without separation of said mold or said injection unit from said insulation unit, to prevent the curing of the elastomeric stock remaining in said injection unit with the curing of the portion of said stock transferred to said cavity;



said insulation unit comprising a first plate having first and second faces and constituted of a thermal-insulatory material, and a second plate having first and second faces and constituted of a different material having a greater tensile strength and a lower capacity to resist heat-transfer than said first plate, said second plate being arranged to be interposed between said injection unit and said first plate with said first faces of said first and second plates directed toward each other, said second face of said first plate defining the one of said side-faces of said insulation unit to be directed toward said mold, said second face of said second plate defining the one of said side-faces of said insulation unit to be directed toward said injection unit, and said first and second plates each having at least one aperture, with each said aperture in each plate being aligned with a corresponding aperture in the other plate, through which elastomeric stock is transferable, said second plate constituting means for preventing the elastomeric stock in said injection unit from coming into adhering engagement with said first face of said first plate.

20. In combination, a mold having at least one cavity in which elastomeric stock can be cured in the form of said cavity, and an apertured insulation unit interposable between said mold and an injection unit from which elastomeric stock can be expelled and transferred through said insulation unit to the cavity of said mold, said mold and injection unit being movable axially relative to one another into and out of pressing association with respective opposite side-faces of said insulation unit,

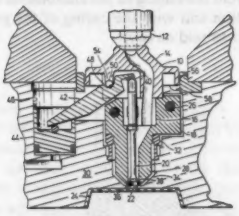
said insulation unit serving to prevent curing of elastomeric stock remaining in said injection unit with the curing of a portion of said stock transferred to said cavity without separation of said mold or injection unit from said insulation unit, said mold including a top plate having a sprue-constituting aperture communicating with said mold cavity, and said insulation unit including a plate constituted of thermal-insulatory material having an aperture communicating with said sprue-constituting aperture; wherein the improvement comprises vent means formed at least in part in said top plate and communicating with said mold cavity for directing the outflow of gas collected in said cavity during filling of the latter with and the curing therein of elastomeric stock, and said vent means comprises a second aperture formed in said top plate, and a blind recess formed in said insulation plate and communicating via an open end thereof with said second aperture.

4,222,733

INJECTION MOLDING FLOW CONTROL MECHANISM

Jobst U. Gellert, and Peter Krause, both of Brampton, Canada, assignors to Mold-Masters Limited, Georgetown, Canada

Filed Dec. 18, 1978, Ser. No. 970,387
Claims priority, application Canada, Dec. 14, 1978, 317947
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—566 **4 Claims**



1. In injection molding flow control mechanism of the type wherein a valve pin is actuated by a pneumatically driven pivoted rocker arm, the rocker arm having a concave recess to receive a convex fulcrum, the improvement comprising;

(a) a cast steel back place having an integral pivot pin portion projecting therefrom, the pivot pin portion defining a concave seat at its extended end, and

(b) a spherical pivot member formed of a material significantly harder than the material of the back plate, the pivot member adapted to be fixedly seated in said seat on the pivot pin portion,

the rocker arm being located with the pivot member received in said recess whereby the rocker arm may be pivoted on the pivot pin portion of the back plate.

4,222,734

REMOTE LIGHTING DEVICE

Roland S. Nolf, R.D. #3, Box 240, Birdsboro, Pa. 19508

Filed Sep. 29, 1978, Ser. No. 947,208
Int. Cl.³ F23Q *2/16, 21/00*
U.S. Cl. 431—156 **7 Claims**

1. A lighting apparatus comprising:

an elongate support member having a base end and a distal end;

a fluid conduit extending from adjacent the base end of the support member to near the distal end and having a fluid inlet at the end adjacent the base end of the support member and a fluid outlet disposed adjacent the distal end of the support member;

retaining means at the base end of the support member for releasably retaining a disposable lighter of the pressurized fuel type having a nozzle movable to an open position;

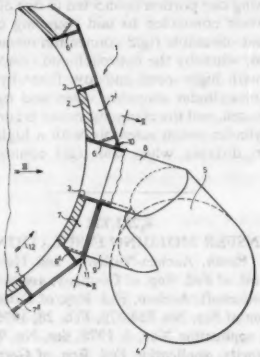
the fluid inlet of the conduit being configured to receive the movable nozzle of the lighter.

4,222,735

CYLINDRICAL ROTARY KILN WITH SATELLITE COOLING TUBES

Antonius Deppe, Neubeckum, Fed. Rep. of Germany, assignor to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,509
Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719762
Int. Cl.² F27B *7/00*
U.S. Cl. 432—80 **2 Claims**



1. A cylindrical rotary kiln rotatable about its longitudinal axis, a plurality of satellite cooling tubes mounted in spaced relationship with respect to one another about said kiln and rotatable with said kiln, the improvement therein of at least two cylindrical material discharge spouts extending between said kiln and the inlet end portion of each said satellite cooing tubes, with the first ones of the cylindrical discharge spouts of the satellite cooling tubes being arranged in an equally spaced annular array about said rotary kiln and with the second ones of the cylindrical discharge spouts of the satellite cooling tubes being arranged in an equally spaced annular array about said rotary kiln, with the second ones of the cylindrical discharge spouts being offset longitudinally and circumferentially with respect to the first ones of the cylindrical discharge spouts.

4,222,736

ROTARY TUBULAR KILN AND SATELLITE COOLER THEREFOR WITH IMPROVED SUPPORT MEANS

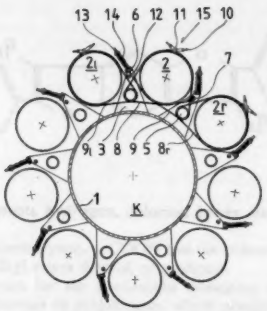
Samuel Hurni, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Filed Dec. 14, 1978, Ser. No. 969,293

Claims priority, application Switzerland, Dec. 21, 1977, 15657/77

Int. Cl.³ F27B 15/02

U.S. Cl. 432—80 11 Claims



1. In a combination with a rotary tubular kiln comprising a kiln casing, satellite cooler means comprising: a plurality of cooling tubes, each comprising inlet sides; support means holding said cooling tubes relative to said kiln casing in a discharge region of said kiln at a plurality of locations spaced axially along said kiln; and inlet pipes connecting said cooling tubes with the interior of said kiln at the inlet sides of said cooling tubes, said support means comprising wire cables forming suspension means to allow for thermal expansion of said cooling tubes.

4,222,737

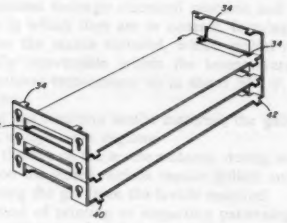
BURN-IN TRAYS FOR SEMICONDUCTOR CIRCUITS

Elmer R. Jones, 124 Chestnut St., North Reading, Mass. 01854

Filed Jan. 22, 1979, Ser. No. 5,580

Int. Cl.² F27D 5/00

U.S. Cl. 432—253 6 Claims



1. A stackable burn-in tray for printed circuit boards adapted for removable insertion in a burn-in chamber, the burn-in chamber having paired opposed tracks to receive the tray which comprises:

a floor having two opposed sides and two opposed ends,

walls joined to the ends by bends, the bends having at least one slot therein, tabs joined to the upper edges of the walls and having a camming surface, the tabs of a first tray adapted to be received in the slots of a next succeeding upper tray to allow stacking of the trays and to prevent relative lateral movement of the trays one to the other,

guide members extending outwardly from the sides of the floor and adapted to engage the tracks of the burn-in chamber, the members positioned to prevent tilting of the tray when inserted into and removed from the chamber.

4,222,738

DENTAL HANDPIECE AND DRIVE ARRANGEMENT THEREFOR

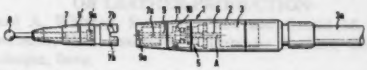
Ernst Strohmaier, Schussenried, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 810,991

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717013

Int. Cl.³ A61C 1/10

U.S. Cl. 433—105 5 Claims



1. In a dental handpiece adapted to have a tooth treatment tool inserted in the tip thereof to drive the tool at different speeds, an output drive shaft for driving the tool, an elongated sleeve having a central axis, a drive motor in said sleeve, a planetary drive mechanism, an input drive shaft coupling said planetary drive mechanism to said drive motor, a transmission member axially aligned with and engageable with said planetary drive mechanism in different transmission ratios to impart different speeds to the tooth treatment tool, and an external shift member coupled with said transmission member for displacement thereof axially of said handpiece along the central axis, the improvement comprising:

interengaging means on said planetary drive mechanism;

counter-engagement means on said transmission member; and

means coupling said transmission member to said output drive shaft solely for rotation of said output drive shaft with said transmission member but permitting axial displacement of said transmission member along said output drive shaft for engaging said counter-engaging means with said interengaging means in different conditions to impart the different speeds to the tool

said planetary drive mechanism comprising a planetary gear arrangement coupled to said input shaft and an intermediate sleeve coupled to said input shaft;

said planetary gear arrangement including epicyclic roll bodies and a drive stub coupled with said roll bodies, said stub having a circumferential wall facing said intermediate sleeve and coaxial therewith;

said transmission member including a circumferential cylindrical wall coaxial with and opening towards said intermediate sleeve;

said interengaging means including first and second axial slots, said first axial slots being peripherally spaced on and internally of said circumferential wall of said stub, and said second axial slots being peripherally spaced on and over said intermediate sleeve at an end thereof towards said transmission member;

said counter-engaging means including peripherally spaced first segments carried by and extending externally from said cylindrical wall for engagement with said first axial slots, and peripherally spaced second segments carried by and extending internally from said cylindrical wall for engagement with said second axial slots;

said counter-engaging means comprising balls, and a cage structure carried by said cylindrical wall for retaining said balls in said cylindrical wall;

said balls having a diameter greater than the thickness of said wall whereby portions of said balls extend externally and internally of said wall; and,

said externally extending portions forming said first segments and said internally extending portions forming said second segments.

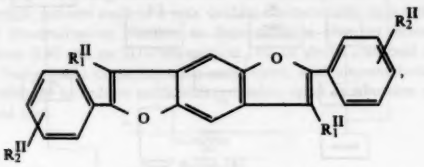
4,222,739

CERTAIN BIS(PHENYL)-BENZODIFURANS

Bruno Kägi, Therwil; Geza Kormany, Allschwil, and Christian Lüthi, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,429
Claims priority, application Luxembourg, Sep. 16, 1977, 78135
Int. Cl.[2] D06P *1/00*; C07D *307/84, 307/80*
U.S. Cl. 8—648 5 Claims

1. A benzodifuran of the formula



wherein

R_1^{II} represents hydrogen, chlorine, lower alkyl or cyano, and

R_2^{II} represents cyano, —COOH and the colourless salts and lower alkyl esters thereof, or p-phenyl.

4. A process for the fluorescent whitening of polyester, polyvinyl chloride or polystyrene, which comprises incorporating in said materials or applying to the surface thereof, compounds as defined in claim 1.

4,222,740

COLORATION METHOD FOR TEXTILES

Walter J. Bohrn, and William A. Moggio, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 5, 1979, Ser. No. 17,181
Int. Cl.[2] D06P *5/12, 5/15*
U.S. Cl. 8—448 11 Claims

1. A coloration method for textiles, which method comprises:

(a) applying to at least a portion of the surface of a textile material a first aqueous composition;

(b) applying over at least a portion of said first aqueous composition a second aqueous composition, one aqueous composition being a chemically gelable composition containing alginic acid or an alginic acid derivative, the other aqueous composition being a gelling agent for the gellable composition; whereby the first and the second aqueous compositions undergo chemical reaction and gel in the regions in which they are in contact, forming gelled regions on the textile material, which gelled regions are thermally irreversible within the temperature range of from ambient temperature up to about 300° F. and water insoluble;

(c) dyeing the resulting textile material, the gelled regions serving as dye resist regions;

(d) fixing the dye on the textile material, during which fixing operation the gelled regions remain gelled; and

(e) removing the gel from the textile material.

6. A method of printing or imparting patterning to textile material in which lateral ink spread is reduced, which comprises:

(a) applying to at least a portion of the surface of a textile material a first aqueous composition;

(b) applying over at least a portion of said first aqueous composition a second aqueous composition, one aqueous composition being a chemically gelable composition containing alginic acid or alginic acid derivative, the other aqueous composition being a gelling agent for the gelable composition, at least one of said gelable composition or said gelling agent composition containing a dye; whereby the first and the second aqueous compositions undergo chemical reaction and gel in the regions in which they are in contact, forming gelled print or pattern regions on the textile material, which gelled regions are thermally irreversible within the temperature range of from ambient temperature up to about 300° F. and water insoluble;

(c) fixing the dye contained in said at least one of the compositions on the textile material, during which fixing operation the gelled regions remain gelled; and

(d) removing the gel from the textile material.

4,222,741

METHOD OF PROCESSING MECHANICALLY REMOVED PORCINE SKINS FOR ULTIMATE GELATIN OR LEATHER PRODUCTION

Edward A. Whitney, Raymore, Mo., and Gerald M. Weiss, Lancaster, Wis., assignors to Dubuque Packing Company, Dubuque, Iowa

Continuation-in-part of Ser. No. 808,698, Jun. 21, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 19,123
Int. Cl.[2] C14C *1/06, 1/08*
U.S. Cl. 8—94.16 6 Claims

1. In a process for treating porcine skins which have been removed from the carcasses of porcine animals, the improvement comprising dehairing said skins in an over-all time of approximately 80 minutes by the following steps:

(a) removing subcutaneous adipose and proteinaceous tissue from the skins for about 5 minutes with water constituting about 50% of the weight of skins at a temperature of about 85° F. (29.4° C.);

(b) chemically burning the skins from step (a) for about 20 minutes with a solution at 85° F.±1° F. (29.4° C.±0.56° C.), the burning solution comprising about 3% lime, 6% soda ash, 1% sodium sulfhydrate, and 1% dimethylamine sulfate in aqueous solution, all measured by weight of skins;

(c) neutralizing the product from step (b) with the neutralizing solution containing about 4% ammonium sulfate by weight of skins in water at 85° F.±1° F. (29.4° C.±0.56° C.) for about 5 minutes;

(d) acidifying the product of step (c) with sulfuric acid solution containing about ½% sulfuric acid by weight of skins in water at 85° F.±1° F. (29.4° C.±0.56° C.) for about 30 minutes; and

(e) washing out residual chemicals from the treated skins produced in step (d) for about 20 minutes with a washing solution of lime in water at a temperature of 85° F.±1° F. (29.4° C.±0.56° C.).

4,222,742

USE OF ACID SALTS IN DYEING AND/OR PRINTING PROCESSES

David Berry, Keyingham, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 2, 1978, Ser. No. 947,756
Claims priority, application United Kingdom, Oct. 5, 1977, 41358/77
Int. Cl.[2] D06M *13/20, 13/36, 13/52*
U.S. Cl. 8—455 8 Claims

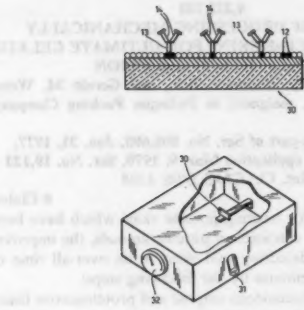
1. A dyeing and/or printing process which employs as an additive a liquid or solid composition comprising one or more cations selected from ammonium, Group I and Group II metals of the Periodic Tables due to Mendeleef, one or more carboxylate anions and water, the ratio of the anion to the cation being in the range of 2:1 and 4:1 on a chemical equivalent basis.

4,222,743

METHOD AND APPARATUS FOR DETECTING BIOLOGICAL PARTICLES BY FLUORESCENT STAIN

Wei-Kung Wang, No. 13, Lane 100, Yen Chiu Yuan Rd., Sec. 2, Nan Kang District, Taipei, Taiwan

Continuation-in-part of Ser. No. 764,613, Feb. 1, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,342
Int. Cl.[2] G01N *33/16, 21/00*
U.S. Cl. 23—230 B 36 Claims



1. Apparatus for detecting biological particles of a particular species in a fluid comprising

a substrate having

a metal film surface on which has been deposited an immunologic coating of at least one layer which comprises,

a layer of protein or protein bound particle adsorbed on said metal film surface with first biological particles randomly distributed therein,

means for applying some third biological particles to the substrate after the substrate has been exposed to a fluid containing suspected second biological particles;

means for producing exciting particles and means to direct said exciting particles toward said third biological particles; means for measuring the quantity of induced signal from said third biological particle and means to direct the exciting particle which have effected excitation away from the quantity measuring means.

17. Method for detecting biological particles of a particular species in a fluid which comprises the steps of:

immersing a substrate having a metal surface into a solution of first biological particle, salt and other kinds of protein for sufficient time to adsorb a monomolecular layer of protein, removing unbound protein by washing said substrate with water, immersing said substrate having said monomolecular layer of said protein thereon into said fluid whereby some of a second biological particle, if present in said fluid, is bound to said first biological particle;

means to apply third biological particle over the said substrate having said first biological particle and said second biological particle;

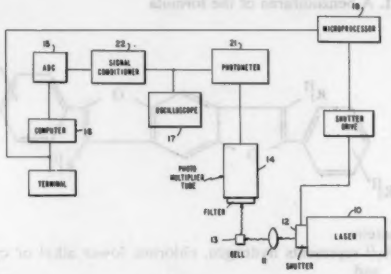
removing unbound particles by washing said substrate with water, examining said substrate by directing exciting particles toward said substrate, directing the exciting particles away from the quantity measuring means and directing the resulting induced particles toward said quantity measuring means to determine the quantity of the induced signal from the said substrate.

4,222,744

ASSAY FOR LIGANDS

Harden M. McConnell, Stanford, Calif., assignor to Becton Dickinson & Company, Paramas, N.J.

Filed Sep. 27, 1978, Ser. No. 946,065
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 56 Claims



1. An assay for a ligand, comprising:

contacting in a fluid a ligand with one of (a) labeled binder or (b) binder and labeled reference ligand; and determining the rate of movement of labeled material in at least one region of the fluid to determine the presence of ligand.

45. An assay for a ligand, comprising:

contacting in a fluid a ligand with one of (a) a binder and a fluorescent labeled reference ligand or (b) fluorescent labeled binder;

subjecting at least one region of the fluid to a photo-bleaching light pulse; and

subsequently subjecting at least a portion of said at least one region to time spaced non-bleaching probe light pulses and detecting fluorescent light emission during said probe light pulses to thereby measure the relationship of recovery of fluorescence and time within said at least one region.

4,222,745

INDICATOR FOR DETECTION OF SO_2 LEAKAGE

James S. Cloyd, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1978, Ser. No. 958,929
Int. Cl.[2] G01N *21/06, 21/12*
U.S. Cl. 23—230 L 6 Claims

1. A composition of matter having a paste-like consistency comprising a mixture of (1) potassium dichromate adsorbed on finely divided silica and (2) a silicone rubber.

5. A method of detecting the leakage from lithium-sulfur dioxide, lithium thionyl chloride or lithium sulfuryl chloride cells of sulfur dioxide or sulfur dioxide generated by leakage of precursor materials, said method comprising the steps of applying to surfaces of the cells a composition yellow in color and having a paste-like consistency, said composition comprising a mixture of (1) potassium dichromate adsorbed on finely divided silica and (2) silicone rubber; and observing the composition so as to detect any color change therein, a change in color from yellow to bluish-green indicating leakage of sulfur dioxide or precursor materials.

4,222,746

DIESEL FUEL CONTAINING WAX OXIDATES TO REDUCE PARTICULATE EMISSIONS

William M. Sweeney, Wappingers Falls, and Harold G. Sprague, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 25, 1979, Ser. No. 32,991
Int. Cl.[2] C10L 1/30
U.S. Cl. 44—68 3 Claims

1. A fuel composition comprising a mixture of hydrocarbons boiling in the range of 350° to 700° F. containing from 0.1 to 1.5 weight percent each of a wax oxidate characterized by a ratio of Neutralization Number to Saponfication Number below about 0.40 and an SUS viscosity at 210° of above 1500 and of a fuel soluble organometallic compound, said amount being sufficient to reduce particulate emission upon combustion of said fuel.

4,222,747

POLISHING MATERIAL FOR OPHTHALMIC LENSES

Jean-Claude Dauguet, Ozoir-la-Ferriere; Jean-Pierre Mazzone, Villiers-sur-Marne, and Pierre Moreau, Saint-Maur, all of France, assignors to Essilor International, Cie Generale d'Optique, Creteil, France

Filed Dec. 27, 1978, Ser. No. 973,725
Claims priority, application France, Jan. 5, 1978, 78 00189
Int. Cl.[2] C09K 3/14
U.S. Cl. 51—301 7 Claims

1. Polishing material, particularly for ophthalmic lenses made of organic material, consisting essentially of, by weight:

30 to 70% cerium oxide;

35 to 65% water; and

0.1 to 5% of a thickening substance;

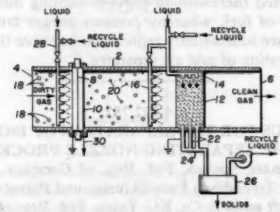
0.1 to 3% of a surface tension reducing substance.

4,222,748

ELECTROSTATICALLY AUGMENTED FIBER BED AND METHOD OF USING

Wesley B. Argo; Burton B. Crocker, and Charles C. Sisler, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 894,951, Apr. 10, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 12,911
Int. Cl.[2] B03C 3/12, 3/16
U.S. Cl. 55—6 28 Claims



1. In a process for continuously removing particulates from a gas stream by flowing the gas sequentially through, first an electrostatic field to place a positive or negative charge on said particulates, and subsequently an irrigated packed bed collector wherein said charged particulates are collected, the improvement whereby even submicron particulates may be separated from the gas stream at high efficiency at high bed velocities while concurrently removing the collected solid particulates from the packed bed without interrupting the gas flow therethrough, which improvement comprises:

(a) flowing said gas stream containing said charged particulates through a bed of fibers having an average fiber diameter of from 50 to 1000 microns, said fiber bed having a voidage of from 90 to 98%, while concurrently

(b) irrigating said fiber bed with a liquid

(i) at a liquid flow rate such that at least a sufficient portion of the fiber bed contains sufficient liquid to dissipate the electrical charge from the fiber bed and the collected particulates contained therein, and

(ii) at least at a frequency such that no significant space charge is permitted to develop within the fibers and collected particulates in the fiber bed, and the collected solid particulates are removed from the fiber bed without substantial retention,

(c) dissipating said electrical charge to an electrical ground, and

(d) draining said liquid and the particulates contained therein from said fiber bed.

13. In an apparatus for continuously removing solid particulates from a gas stream comprising a housing having inlet and outlet ends, particulate charging section within said housing proximate said inlet and comprising a plurality of high voltage discharge electrodes connected to a D.C. voltage source at least one grounded electrode positioned and arranged with respect to said high voltage electrodes to create a substantially uniform electrostatic field therebetween, a packed bed collector for charged particulates disposed within said housing downstream of said particle charging section, and a means for irrigating said packed bed with a liquid, the improvement whereby even submicron particulates may be separated from the gas stream at high efficiency at high bed velocities while concurrently removing the collected solid particulates from the bed without interrupting the gas flow therethrough, which improvement comprises

(a) said packed bed comprising fibers having an average fiber diameter of from 50 to 1000 microns, said fiber bed having a voidage of from 90 to 98%;

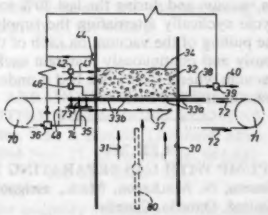
(b) said irrigating means comprising means for a liquid flow such that at least a sufficient portion of the fiber bed contains sufficient liquid to dissipate the electrical charge from the fiber bed without permitting any significant space charge to develop within the fiber bed, and the collected solid particulates are removed from the fiber bed without substantial retention.

4,222,749

REMOVING PARTICLES FROM A PARTICLE-CONTAINING FLUID

Gerald Moss, Wantage, England, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 23, 1978, Ser. No. 880,381
Claims priority, application United Kingdom, Feb. 23, 1977, 7604/77
Int. Cl.[2] B01D 46/38, 37/02
U.S. Cl. 55—18 8 Claims



1. A method of removing particles from a fluid in which the particles are contained which comprises passing the particles-containing fluid upwardly through a bed of fluidizable solids containing a conditioning agent under such conditions that substantially no fluid jets spout up from the top region of the bed, the said conditioning agent being selected so as to have

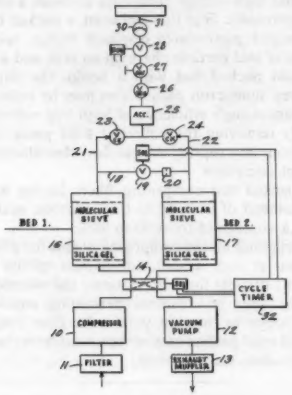
the property of imparting to the fluidizable solids of the bed, under the normal conditions of operation thereof, a relatively high degree of stickiness at one instant or period of time and a lower degree or substantial absence of stickiness at another instant or period of time due to physical and/or chemical changes in the said conditioning agent under the bed operating conditions so that particles adhere to said solids in the bed at said one instant or period of time, whereby the amount of said particles in the said fluid leaving the said bed is less than the amount of said particles in said fluid entering the said bed at least during the time interval between the said one instant or period of time and the said another instant or period of time.

4,222,750

OXYGEN ENRICHMENT SYSTEM FOR MEDICAL USE

William D. Gauthier, Sylvania; Merl J. Hendricks, Pemberville, and Robert L. Babcock, Toledo, all of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Aug. 16, 1976, Ser. No. 714,782
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—58 **2 Claims**



1. In a method of operating an oxygen enrichment system including two nitrogen adsorbing beds, an air compressor and a vacuum pump, comprising the steps of applying a continuous air stream under pressure from the compressor through one bed, removing a primary effluent stream of O_2 enriched gas from such one bed, simultaneously pulling a continuous vacuum on the other bed to partially purge such other bed by removing nitrogen, completing the purging and regeneration of such other bed by introducing high purity O_2 enriched gas from such one bed through such other bed while such other bed is under a vacuum and during the last 20% to 33% of the adsorption cycle cyclically alternating the supply of the air stream and the pulling of the vacuum on each of the two beds to simultaneously and continuously maintain each bed under pressure or vacuum whereby only one bed is under the supply of the air stream at any one time.

4,222,751

LIQUID PUMP WITH GAS SEPARATING MEANS

Richard F. Shunta, N. Muskegon, Mich., assignor to Anthes Imperial Limited, Ontario, Canada

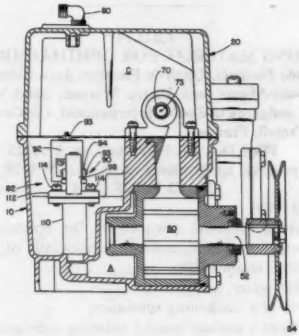
Filed Aug. 28, 1978, Ser. No. 937,537
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—204 **19 Claims**

1. A fluid pump for dispensing fuel from storage tanks, and substantially eliminating air from the fuel being pumped, said pump comprising:

a housing having a fluid inlet, a fluid outlet and an air outlet, said housing defining a pump cavity including a pump therein coupled between said inlet and said outlet and a cylindrical cyclone separator, said housing further defining a vent cavity with a wall separating said cyclone separator and said vent cavity wherein said wall includes an orifice axially aligned with the axis of said cylindrical cyclone separator;

a scavenging tube extending into said cylindrical cyclone separator in coaxial relationship to said orifice, said scavenging tube and said orifice having diameters selected to capture substantially all air bubbles forming a cone in the cyclone separator; and

a pressure activated control valve coupled to said fluid outlet and having a damper connected therewith to alleviate sudden opening and closing of said control valve and consequent pressure surges in the pump, thereby maintaining the size of the cone of air bubbles relatively constant



during pump operation for effective elimination of the air bubbles from the fuel.

14. A pump for dispensing fuel from storage tanks and separating air and vapor therefrom comprising:

pump means having an inlet to be coupled to a source of fuel and an outlet;

an air separator of the tangential entry cyclone type coupled to said outlet of said pump means and operative to separate air and vapor from pure fuel; and

a pressure activated control valve located downstream of said air separator to discharge the pure fuel from the pump for dispensing fuel, said valve means having a damper connected therewith to prevent hunting during the discharge of fuel, whereby pressure surges internal to the pump are substantially reduced to improve the efficiency of operation of said air separator.

4,222,752

APPARATUS FOR THE SEPARATION OF ISOTOPES BY THE SEPARATING NOZZLE PROCESS

Werner Wenzel, Spellen, Fed. Rep. of Germany, assignor to NUSTEP Trenndüsen Entwickfungs- und Patentverwertungsgesellschaft mbH & Co. KG, Essen, Fed. Rep. of Germany

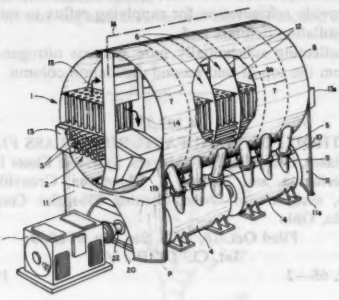
Filed Jul. 27, 1978, Ser. No. 928,436
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741461
Int. Cl.[2] B01D *59/00*
U.S. Cl. 55—269 **6 Claims**

1. In an apparatus for isotope separation having a plurality of separating stages connected in a separation cascade, each of said stages comprising a separating-nozzle unit and a heat exchanger connected upstream from said unit for abstracting heat from the compressed gas forced through said unit, said apparatus also including compressor means for compressing the gas upstream of each of said heat exchangers, the improvement which comprises the combination of:

a substantially cylindrical hermetically sealed vessel having

a generally horizontal axis and subdivided internally by a plurality of diametral partitons defining chambers between them, each of said chambers containing a respective one of said stages;

means in said vessel supporting said heat exchangers with one another and all at the same level in said vessel, said



heat exchangers having common heat exchanger tubes extending substantially the length of said vessel through all of said chambers and through said partitions; and

a distributor at one end of said vessel for distributing a coolant to said tubes, and a collector at the opposite end of said vessel for collecting coolant from said tubes.

4,222,753

SUCTION CLEANER

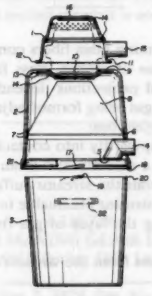
Robert G. Mills, 11 Forest Close, Red Deer, Alberta, Canada

Filed Jun. 6, 1978, Ser. No. 913,091

Claims priority, application Canada, Jun. 2, 1978, 304648

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—274 **4 Claims**



1. A suction cleaner comprising a suction unit, a body section including a suction inlet, and a bucket adapted to be secured to the body section beneath the same to collect waste matter sucked into the cleaner through the inlet, the bucket having handle means externally thereof to permit said bucket to be manually supported and rotated relative to the body section, a plurality of cooperable securing means, one portion of said securing means being disposed on the upper external periphery of said bucket and a second cooperating portion being disposed around the lower internal periphery of said body section, said portions cooperating to secure the bucket to the body section and to release the bucket therefrom upon rotation of the bucket relative to the body section, one of said securing means portions comprising a plurality of circumferentially spaced cam slots inclined to the horizontal axis of said cleaner, the other of said securing means portions comprising a plurality of mating cam lip projections also inclined to said horizontal axis, whereby when said two portions are engaged and said bucket is rotated relative to said body section, the bucket will move axially, and a resilient gasket provided within said body section and spaced inwardly from the lower peripheral edge thereof, said securing means portions being initially engageable prior to any deformation of said gasket due to said spacing and thereafter being deformable upon further rotation of said bucket to provide a seal between said bucket and body section.

4,222,754

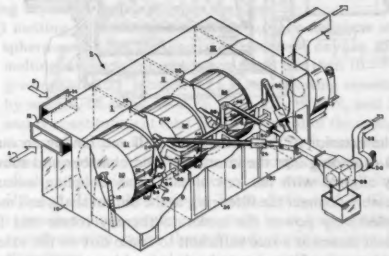
HIGH EFFICIENCY FILTER FOR TEXTILE WASTE

Ivan J. Horvat, P.O. Box 1782, Gastonia, N.C. 28052

Filed Nov. 24, 1978, Ser. No. 963,371

Int. Cl.[2] B01D *46/04*; A47L *9/20*

U.S. Cl. 55—283 **18 Claims**



1. A high efficiency filter system for cleaning a contaminated air stream returning from a textile production area and the like comprising:

(a) a plurality of sequential filter stages, each stage being housed within a separate compartment substantially isolated from the others of said compartment;

(b) inlet means for introducing said contaminated air stream to the first of said compartments; means for transferring the output of each stage to the next compartment; and outlet means through which the output of the final stage is returned to the production area;

(c) each of said filter stages including a rotary drum filter mounted within the corresponding compartment and a stripping means selectively operatively associated with at least the periphery of each of said drum filters for cleaning the filter surfaces thereof, each of said rotary drum filters having a filter media of a different type covering the peripheral surfaces thereof;

(d) control means connecting all of said stages for automatically and periodically, but not continuously, activating an individual one of said stripping means to effect cleaning of the peripheral surface of the corresponding rotary drum filter exclusively of the others.

4,222,755

AIR FILTER ARRANGEMENT TO PERMIT CLEANING WITHOUT REMOVING ELEMENT

LaVon P. Grotto, R.R. 3, Box 62, Litchfield, Minn. 55355

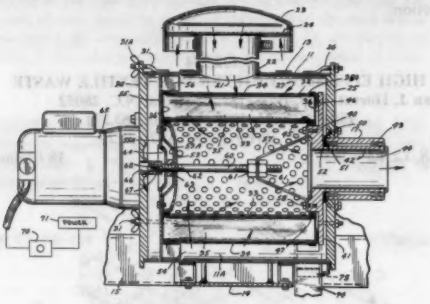
Filed Nov. 17, 1978, Ser. No. 961,493

Int. Cl.[3] B01D *46/04*

U.S. Cl. 55—291 **11 Claims**

1. An air filter assembly including an outer housing having a peripheral wall defining a chamber having a central axis and first and second end walls extending generally transverse to the central axis, at least the first end wall being removable, said outer housing having an air inlet and an outlet adapted for connection to an air intake of an engine, filter element means interposed between said inlet and outlet and of a type to filter air passing from said inlet to said outlet without rotation of the filter element means, said outlet being defined by a tube, means

to rotatably mount said tube on the first end wall of said outer housing about an axis substantially aligned with the central axis, said filter element means comprising an annular filter ring mounted for rotation with said tube and surrounding the axis of the tube, and means sealing said filter ring relative to the tube to cause air moving from said inlet to said outlet to pass through said filter element means, and motor means mounted



on the exterior of the second end wall and having an output shaft extending into the interior of said chamber and substantially aligned with the axis of said tube, coupling means to releasably connect the filter ring to the output shaft, and means to selectively power the motor to thereby rotate said filter element means at a rate sufficient to cause dirt on the exterior of said annular filter ring to be dislodged by centrifugal force.

4,222,756

TONNAGE NITROGEN GENERATOR

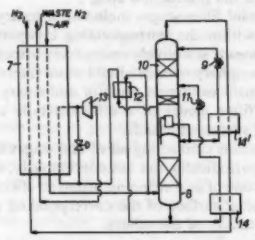
Robert M. Thorogood, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 7, 1979, Ser. No. 36,488

Claims priority, application United Kingdom, May 12, 1978, 19125/78

Int. Cl.³ F25J 3/04

U.S. Cl. 62—13 **5 Claims**



1. A process for producing substantially pure gaseous nitrogen product which comprises:

(a) removing substantially all of the carbon dioxide and water vapor from a feed air stream;

(b) introducing said dry, carbon dioxide-free feed air stream into a first distillation column and forming an overhead vapor fraction and a bottom liquid fraction;

(c) expanding at least part of said overhead vapor fraction in a work expansion engine to a second, lower pressure;

(d) expanding at least part of said bottoms liquid fraction to a second, lower pressure;

(e) introducing at least part of both expanded lower pressure fractions into a second distillation column;

(f) providing a condenser-reboiler at least partially submerged in the liquid bottom product of said second distillation column and providing reflux to said first distillation column from said condenser-reboiler;

(g) expanding at least a portion of the liquid bottom product of said second distillation column to a further lower pressure;

(h) utilizing said expanded, further lower pressure liquid bottom product from said second distillation column to provide refrigeration for supplying reflux to said second distillation column; and

(i) collecting substantially pure gaseous nitrogen product from the top of said second distillation column.

4,222,757

METHOD FOR MANUFACTURING GLASS FIBERS

H. I. Glaser, Granville; F. D. Meyers, Sylvania; Elmer P. Rieser, Pickerington, and Thomas K. Thompson, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 16, 1978, Ser. No. 952,039

Int. Cl.² C03B 37/02

U.S. Cl. 65—2 **19 Claims**

17. Method of forming glass fibers comprising:

(a) flowing streams of molten glass from a stream feeder through orificed projections depending from the feeder floor, a layer of gas being formed adjacent the feeder floor between the projections;

(b) directing gas upwardly into contact with the streams of molten glass at a velocity and in an amount effective to convey away from the streams sufficient heat to render the glass of the streams attenuable to fibers without completely removing the layer of gas from the feeder floor; and

(c) attenuating fibers from the streams of molten glass.

4,222,758

APPARATUS FOR PROCESSING FILAMENTS

David V. Stotler, and James E. Sanders, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 27, 1978, Ser. No. 973,823

Int. Cl.² C03B 37/02

U.S. Cl. 65—11 W **7 Claims**

1. Apparatus for processing filaments:

a feeder adapted to supply a plurality of streams of material at a first temperature;

attenuation means adapted to attenuate said streams into said filaments at a first speed;

a first member adapted to gather said filaments into a strand in contact with said attenuation means and to orient said filaments in a predetermined array approaching said first member;

a second gathering means adapted to orient said filaments to

approach said attenuation means as plurality of spaced-apart bundles of filaments having a predetermined number of filaments in said bundles;

first control means for modifying the temperature of said feeder to supply said streams at a second temperature;

second control means adapted to operate said attenuation means at a second speed;

means for moving said first member and said second member

with respect to each other such that said second member contacts said array to orient said filaments to contact attenuation means as a plurality of spaced-apart bundles of filaments; and

sensing means for activating said first and second control means adapted to operate said feeder at said second temperature and operate said attenuation means at said second speed when said second member is not in contact with said filaments.

4,222,759

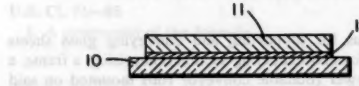
PROCESS FOR MAKING GLASS DESIGN PIECES

Helena M. Kedda, 9012 Spring Hill La., Chevy Chase, Md. 20015

Filed Sep. 5, 1979, Ser. No. 72,604

Int. Cl.³ C03C *27/00*

U.S. Cl. 65—23 **3 Claims**



1. A process for preparing at least a double thickness glass design piece with a rounded surface comprising gluing together with a heat destructible glue first and second glass pieces with the same contours, said second piece being smaller than said first by a margin completely surrounding the larger of ¼ inch, firing the two pieces with said second piece being on top to fuse them and until the top edge of the top piece has rounded into the bottom piece and gradually cooling the fused design piece to room temperature.

4,222,760

PREPARATION OF OXYNITRIDE GLASS-CERAMICS

Kenneth Chyung, Painted Post, and Raja R. Wusirika, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 966,193, Dec. 4, 1978, which is a division of Ser. No. 896,355, Apr. 14, 1978, Pat. No. 4,141,739, which is a division of Ser. No. 843,972, Oct. 20, 1977, Pat. No. 4,097,295, which is a division of Ser. No. 735,313, Oct. 26, 1976, Pat. No. 4,070,198, which is a continuation-in-part of Ser. No. 664,263, Mar. 5, 1976, abandoned. This application Aug. 2, 1979, Ser. No. 63,151

Int. Cl.² C03B *32/00*; C03C *3/22*

U.S. Cl. 65—32 **8 Claims**

1. A method for making a glass-ceramic article having a crystal content in excess of about 50% by volume wherein the predominant crystal phase is selected from the group consisting of a silica crystal, a silicate crystal and/or a nitrogen-containing crystal, which comprises the steps of:

(a) melting in a nitrogen or other oxygen-deficient atmosphere such that the partial pressure of oxygen in the melting environment is between about less than 10^{-10} and greater than 10^{-1} a batch for a glass consisting essentially, by weight, of about 40–80% SiO_2, 2.5–17% N, said SiO_2 and N constituting at least 50% by weight of the composition, and at least 15% M_xO_y, wherein M_xO_y consists of at least one oxide selected from the group consisting of the alkali metal oxides, the oxides of the elements of Groups IIA and IIB of the Periodic Table, B_2O_3, and Al_2O_3;

(b) simultaneously cooling the melt to at least within the transformation range thereof and shaping a glass body therefrom;

(c) thereafter subjecting said glass body to a temperature between about 800°–1300° C. for a period of time sufficient to crystallize said glass body in situ throughout; and then

(d) cooling the crystallized body to room temperature.

4,222,761

GLASSWARE FORMING MACHINES

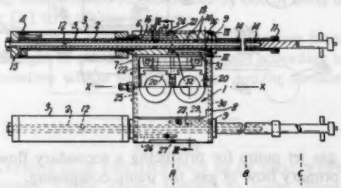
David Braithwaite, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 9, 1979, Ser. No. 19,052

Claims priority, application United Kingdom, Mar. 17, 1978, 10663/78

Int. Cl.² C03B *11/00*

U.S. Cl. 65—207 **6 Claims**

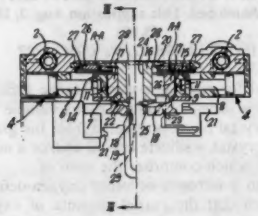


1. A glassware forming machine having a plurality of stations one of which is a blank station at which parisons are formed from gobs of molten glass in an upwardly open parison mould, a carriage for moving the parisons from the blank station to a further station, and guide means for guiding the carriage for reciprocatory straight line motion between the blank station and the further station, the carriage having relatively movable neck ring parts for engaging the neck of a parison, means for relatively moving the neck ring parts under the pressure or suction influence of fluid connected to the carriage through the guide means, the neck ring parts being closed when the carriage is at the blank station to engage the finish of the parison and open when the carriage is at the further station to release the parison.

4,222,762
GLASSWARE FORMING MACHINES

David Braithwaite, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 9, 1979, Ser. No. 19,194
Claims priority, application United Kingdom, Mar. 17, 1978, 10662/78
Int. Cl.² C03B 11/00
U.S. Cl. 65—226 6 Claims

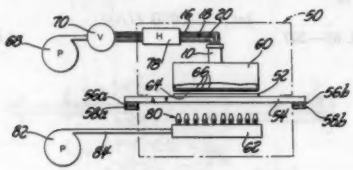


1. A glassware forming machine comprising a carriage, a blank station at which parisons are formed in upwardly open parison moulds from gobs of molten glass, and a further station, the carriage being reciprocable in a straight line between the blank station and the further station in order to transfer parisons from the blank station to the further station, the carriage having a neck ring mould comprising neck ring parts and an element which defines the sealing surface of the finish of each parison, and the carriage having means for raising and lowering said element relative to the neck ring parts, the element being raised when the carriage is at the further station in order that said element should clear the released parisons on return movement of the carriage to the blank station.

4,222,763
GAS JET PUMP, AND APPARATUS USING SAME

Harold A. McMaster, 420 Water St., Woodville, Ohio 43469

Filed Dec. 11, 1978, Ser. No. 968,232
Int. Cl.² C03B 23/02; F04F 5/22
U.S. Cl. 65—287 16 Claims



1. A gas jet pump for producing a secondary flow of gas from a primary flow of gas, the pump comprising:

a passageway having a flow axis and an inner surface which extends along the flow axis with a cross section that has a smoothly curved shape and is concave with respect to the interior of the passage; and

a plurality of jet openings formed in the surface for introducing the primary gas flow into the passage, each jet opening having axial and circumferential components and being substantially tangent to the inner surface of the passage such that the primary flow introduced thereinto flows vortically in an axial direction and moves a secondary flow of gas therewith through the passage.

13. Apparatus for use in bending heated sheet glass, the apparatus including a heating chamber, a horizontal conveyor for moving sheet glass through the heating chamber, a vacuum holder having a lower surface positioned above the conveyor and including spaced openings through the surface; a control system for the holder comprising:

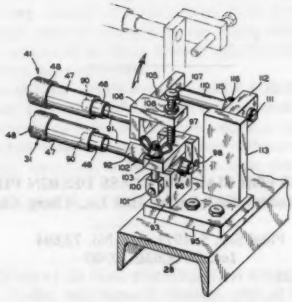
a gas jet pump located within the chamber and including an elongated tubular body having a round inner surface defining a flow passage, the tubular body having a first end communicated with the openings in the surface of the holder and a second end that opens within the chamber, and a plurality of jet openings formed in the tubular body extending to the inner surface thereof in a tangential relation therewith and having both axial and circumferential components with respect to the longitudinal axis of the tubular body, the axial component of each jet opening being oriented toward the second end of the tubular body away from the first end thereof, and

a source of pressurized gas located externally of the enclosed chamber and being communicated with the jet openings of the tubular body such that gas from the source is introduced thereinto through the jet openings and flows vortically in an axial direction to move a secondary flow of gas therewith through the flow passage so as to support the heated sheet of glass on the holder surface.

4,222,764
GLASS SHEET SUPPORTING AND CONVEYING APPARATUS

Robert G. Revells, and Donald D. Rahrig, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 23, 1979, Ser. No. 32,453
Int. Cl.² C03B 27/00
U.S. Cl. 65—348 10 Claims



1. Apparatus for supporting and conveying glass sheets through a horizontal tempering section comprising: a frame, a plurality of lower rotatable conveyor rolls mounted on said frame, a plurality of upper rotatable conveyor rolls mounted on said frame, each of said upper rolls comprising a generally horizontally extending central portion in substantial parallelism with said lower rolls but spaced thereabove a distance slightly greater than the thickness of the glass sheets to be conveyed thereby so that said advancing sheet normally contacts only said lower rolls or said upper roll central portions at any given time during its passage therebetween, and means supporting said upper rolls for free pivotal movement relative to said lower rolls.

4,222,765
THIOLCARBAMIC ACID ESTERS

Shuichi Takayama, Shimizu; Takehito Ishikawa, Shizuoka; Ichiro Kimura, Shizuoka, and Syozi Shigematu, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 763,243, Jan. 27, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,104

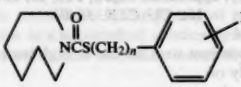
Claims priority, application Japan, Jan. 30, 1976, 51-9083

Int. Cl.[2] A01N *9/12, 21/02;* C07D *295/14*

U.S. Cl. 71—88 3 Claims

1. A herbicidal compound for the control of noxious plants in paddy fields, which comprises:

a compound of the formula:



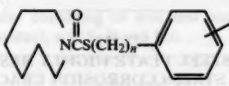
wherein

X represents hydrogen or chlorine and

n represents an integer of 2 or 3.

3. A herbicidal composition, which comprises:

an insert carrier and a herbicidally effective amount of a thiolcarbamic ester having the formula:



wherein X represents hydrogen or chlorine and n represents an integer of 2 or 3.

4,222,766
QUATERNARY AMMONIOALKANECARBOXYLIC ACID ANILIDES AS PLANT GROWTH INFLUENCING AGENTS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 751,616, Dec. 16, 1976, Pat. No. 4,141,718. This application Jan. 2, 1979, Ser. No. 215

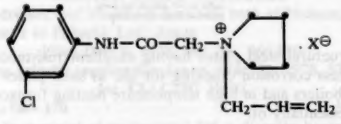
Claims priority, application Switzerland, Dec. 23, 1975, 16704/75

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.[2] A01N *9/22;* C07D *207/06*

U.S. Cl. 71—95 11 Claims

1. A compound of the formula



wherein X is the anion of any non-phytotoxic acid.

6. A method for inhibiting the growth of dicotyledonous plants which comprises applying thereto a growth inhibiting effective amount of a compound according to claim 1.

4,222,767
CERTAIN HERBICIDAL SULFONATES AND SULFAMATES

Peter S. Gates, and Derek Baldwin, both of Cambridge, England, assignors to Fisons Limited, London, England

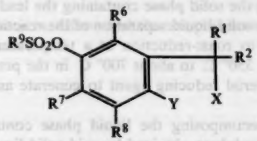
Division of Ser. No. 875,189, Feb. 3, 1978, Pat. No. 4,162,154. This application Mar. 21, 1979, Ser. No. 22,599

Claims priority, application United Kingdom, Feb. 5, 1977, 4847/77; Feb. 5, 1977, 4848/77; Feb. 5, 1977, 4849/77; Aug. 5, 1977, 32839/77

Int. Cl.[2] A01N *9/14;* C07C *143/06, 143/26*

U.S. Cl. 71—103 11 Claims

1. A sulphonate of the formula:



(I)

wherein X represents a group —CHR[3]—OR[4] and Y represents a group —OR[5]; R[1], R[2] and R[3], which may be the same or different, each represent hydrogen or C 1 to 6 alkyl, or R[1] and R[2] together or R[2] and R[3] together form a C 3 to 6 alkylene chain; R[4] and R[5], which may be the same or different, each represent hydrogen, C 1 to 6 alkyl, C 2 to 6 alkenyl, C 2 to 6 alkynyl, phenyl, a group —C(=O)R[10] or a group —SO_2R^{11}; R[6], R[7] and R[8], which may be the same or different, each represent hydrogen, C 1 to 6 alkyl, halogen, cyano, C 2 to 6 carboxylic acyl, or C 1 to 4 alkoxy; R[9] represents C 1 to 6 alkyl, phenyl or C 7 to 10 phenylalkyl (each of which may be unsubstituted or substituted by one or more chlorine or bromine atoms, C 1 to 4 alkyl groups, C 1 to 4 alkoxy groups or nitro groups), C 5 to 7 cycloalkyl, C 1 to 4 alkylamino, or dialkylamino wherein each alkyl moiety has from 1 to 4 carbon atoms; R[10] represents C 1 to 6 alkyl or alkoxy, C 2 to 6 alkenyl or alkenyloxy, C 2 to 6 alkynyl or alkynyloxy, phenyl, phenoxy, phenylamino, C 1 to 6 alkylamino or dialkylamino wherein each alkyl moiety has from 1 to 6 carbon atoms, each of the groups which R[10] may represent being unsubstituted or substituted by one or more halogen atoms or C 1 to 4 alkoxy groups; and R[11] represents C 1 to 6 alkyl, phenyl, C 1 to 6 alkylamino or dialkylamino each of the alkyl moieties thereof having from 1 to 6 carbon atoms, each of the groups which R[11] may represent being unsubstituted or substituted by one or more halogen atoms or C 1 to 4 alkoxy groups.

11. A herbicidal composition which comprises from 0.5 to 85% by weight of one or more compounds according to claim 1 in association with a suitable carrier and/or surface active agent.

4,222,768
METHOD FOR PRODUCING ELECTRIC STEEL

Itaru Suyama, Chiba, Japan, assignor to Asahi Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 20,178

Claims priority, application Japan, Mar. 14, 1978, 53-28253; Feb. 29, 1979, 54-21873

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—12 9 Claims

1. In a method for producing carbon steel or alloy steel by an electric steel-making procedure comprising the steps of charging a steel scrap into an electric furnace, melting the scrap, refining the melt by an oxidation stage and reduction stage and separating the molten steel from the slag, the improvement comprising charging silicon carbide into the furnace at any time before the completion of the oxidation stage in the refining step, thereby decreasing the amounts of the constituent metals in the steel which will be oxidized and move to the slag.

4,222,769

PROCESS OF REGENERATING AND RECOVERING LEAD SULPHATE-CONTAINING WASTES

Masaaki Okuda, Uozu, and Kiyotaka Tomisaki, Toyama, both of Japan, assignors to Diamon Engineering Co., Ltd., Japan

Filed Dec. 19, 1978, Ser. No. 971,827
Claims priority, application Japan, Jan. 6, 1978, 53-257
Int. Cl.[2] C22B *13/04*
U.S. Cl. 75—120 6 Claims

1. A process of regenerating and recovering lead from lead battery scrap which comprises

(i) contacting the lead battery scrap with an aqueous solution of ammonium carbonate to form lead carbonate and ammonium sulphate,

(ii) subjecting the solid phase containing the lead carbonate obtained by solid-liquid separation of the reaction product so formed to roast-reduction at a temperature ranging from about 350° C. to about 700° C. in the presence of a carbon material reducing agent to generate and recover the lead,

(iii) double decomposing the liquid phase containing the ammonium sulphate obtained by said solid-liquid separation by the addition of calcium hydroxide in an amount such that the molar ratio of the calcium hydroxide added, expressed as $Ca(OH)_2/(NH_4)_2SO_4$ is about 1.05 to about 1.90 and that the concentration of a calcium sulfate slurry formed as by-product is about 5 to about 10%, and further contacting ammonium hydroxide thus formed with carbon dioxide gas, to recover ammonium carbonate in a form of an aqueous solution for reuse in said contacting step (i), and

(iv) recycling the aqueous ammonium carbonate solution to step (i).

4,222,770

ALLOY FOR OCCLUSION OF HYDROGEN

Yasuaki Osumi, Minou; Hiroshi Suzuki, Ikeda; Akihiko Kato, Matsubara; Masanori Nakane, Takatsuki, and Yoshizo Miyake, Toyonaka, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 9, 1979, Ser. No. 18,941
Claims priority, application Japan, Mar. 31, 1978, 53-38662; May 31, 1978, 53-66118
Int. Cl.[2] C22C *19/03*
U.S. Cl. 75—122 5 Claims

1. An alloy for the occlusion of hydrogen and having the generic formula $MmNi_{5-x}A_x$, wherein Mm is a mischmetal comprising 25 to 30% by weight of La, 40 to 45% by weight of Ce, 10 to 15% by weight of Pr, 4 to 5% by weight of Nd, and 4 to 7% by weight of Sm+Gd as essential elements and accompanying elements entrained by said essential elements, A is a member selected from the group consisting of B, Ca, Cr, Cu, Fe, V, Zn and Si, and x is a numerical value in the range of 0.01 to 2.

4,222,771

HIGH CHROMIUM STEEL OF MIXED STRUCTURE CONTAINING FERRITE FOR HIGH TEMPERATURE USE

Teishiro Oda, Nagasaki; Takashi Daikoku, Togitsumachi; Teruo Yukitoshi, Fujiidera, and Kazuhiko Nishida, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries Limited, Osaka, both of, Japan

Continuation of Ser. No. 788,467, Apr. 18, 1977, abandoned, which is a continuation of Ser. No. 661,330, Feb. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,428, Jul. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,532, Jan. 3, 1974, abandoned. This application Jan. 23, 1979, Ser. No. 5,762
Claims priority, application Japan, Feb. 28, 1973, 48-23841
Int. Cl.[2] C22C *39/02*
U.S. Cl. 75—124 2 Claims

1. A high chromium steel for use at high temperatures consisting essentially of:

0.02–0.09% carbon,
less than 1.0% silicon,
0.1–2.0% manganese,
7.0–13.0% chromium,
1.2–3.0% molybdenum,

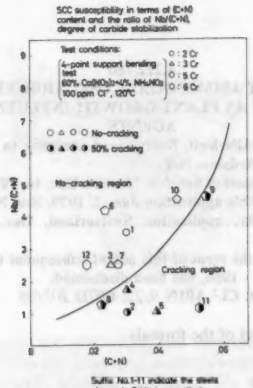
said steel further consisting essentially of a mixed structure of ferrite and bainite, the ferrite phase being present in an amount from about 20 to 60% with the balance being iron and the usual impurities.

4,222,772

STRUCTURAL STEEL PLATE HIGHLY RESISTANT TO NITRATE STRESS CORROSION CRACKING

Yasuo Sogo; Hiroki Masumoto, both of Kitakyushu; Kazunari Yamato, Sagamihara; Yasuhiko Miyoshi, Tokyo; Tomomi Murata, Yokohama, and Eiji Sato, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 23, 1979, Ser. No. 14,631
Claims priority, application Japan, Feb. 24, 1978, 53/19725
Int. Cl.[3] C22C *37/10, 39/14, 38/06*
U.S. Cl. 75—124 3 Claims


SCC susceptibility in terms of (C+N) content and the ratio of Nb/(C+N), degree of carbide stabilization
Test conditions:
4-point support bending test
60% Ca(NO3)2+4% NH4NO3
100 ppm Cl⁻, 120°C
○ : 2 Cr
△ : 3 Cr
○ : 5 Cr
○ : 8 Cr
○ △ ○ ○ No-cracking
● ▲ ● ● 50% cracking
No-cracking region
Cracking region
Nb/(C+N)
(C+N)
Suffix No.1-11 indicate the steels shown in Table 4 respectively.

1. Structural steel plates having excellent resistance to nitrate stress corrosion cracking for use as shell plates for hot stoves, boilers and in high temperature heating furnaces, consisting essentially of:

C: 0.005–0.056%;
Si: 0.1–1.0%;
Mn: 0.1–2.0%;
P: not more than 0.025%;
S: not more than 0.025%;

Cr: 2–6%;
Nb: 0.01%–7 (C+N)%;
Al: 0.01–0.20%;
(C+N): not more than 0.06% and the balance being essentially Fe and unavoidable impurities.

4,222,773

CORROSION RESISTANT AUSTENITIC STAINLESS STEEL CONTAINING 0.1 TO 0.3 PERCENT MANGANESE

Jörgen Degerbeck, Fagersta, Sweden, assignor to Fagersta AB, Fagersta, Sweden

Continuation of Ser. No. 903,258, May 5, 1978, abandoned. This application May 29, 1979, Ser. No. 43,240
Int. Cl.[2] C22C *38/02, 38/42*
U.S. Cl. 75—125 **8 Claims**

1. Austenitic stainless steel, completely or practically completely austenitic in a hot-worked, solution heat-treated condition, characterized in that it consists essentially of:

C<0.10%
Si<1.5%
Mn 0.10–0.30%
Cr 17–20%
Ni 6–16%
Cu 2.0–4.0%
N>0.40%
Ti>1.0%
Nb>1.5%
B>100 ppm
the remainder consisting of iron and impurities normally present in steel, e.g. S, P and Mo.

4,222,774

ALUMINUM ALLOY

Francois-Regis Boutin, Virieu-sur-Bourbre; Michel Deleuze, Annecy; Daniel Marchive, Voiron, and Rene Reze, Castelsarrasin, all of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Annecy, France

Filed Feb. 23, 1979, Ser. No. 14,710
Claims priority, application France, Mar. 20, 1978, 78 08833
Int. Cl.[3] C22C *21/02*
U.S. Cl. 75—148 **6 Claims**

1. An aluminum alloy consisting essentially of the following composition (percent by weight):

Mn	0.9 to 1.5
Si	1.0 to 1.5
Cr	0.05 to 0.2
Fe ≧	0.4
Ni ≧	0.05
Fe + Ni + Co	0.8 to 2
Mg <	0.2
Cu <	0.2

any other elements in a total quantity of less than 0.2, with the remainder aluminum.

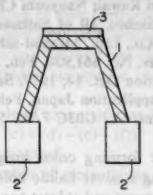
4,222,775

BASE METAL PLATE MATERIALS FOR DIRECTLY HEATED OXIDE CATHODES

Akira Misumi, and Masaharu Kumada, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 5, 1978, Ser. No. 966,610
Claims priority, application Japan, Mar. 31, 1978, 53-36782
Int. Cl.[2] C22C *19/03*
U.S. Cl. 75—170 **5 Claims**

1. A base metal plate material for a directly heated oxide cathode which consists essentially of nickel as a main component, 2.0 to 5.5 atomic percent of rhenium, an amount of molybdenum sufficient to provide improved mechanical strength and electrical resistance at high temperature to the plate material up to not more than 7 atomic percent and at least one reducing agent selected from the group consisting of zirconium, magnesium, silicon and aluminum in an amount up to 3.5 atomic percent.

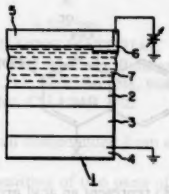


4,222,776

ELECTROPHOTOGRAPHIC METHOD

Syusei Tsukada, Tokyo; Yujiro Ando, Yokohama, and Hiroshi Tanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 317,783, Dec. 22, 1972, abandoned. This application Jan. 21, 1977, Ser. No. 760,855
Claims priority, application Japan, Dec. 30, 1971, 47/1482
Int. Cl.[2] G03G *13/02, 13/14, 13/24*
U.S. Cl. 430—55 **20 Claims**



1. An electrophotographic process for forming an electrostatic latent image on a photosensitive medium having an insulative layer and an underlying photoconductive layer, said process comprising:

the primary charging step of uniformly charging said insulative layer;

the step of contacting a non-insulative liquid with said insulative layer and applying a desired voltage to said liquid to thereby discharge or charge said insulative layer and simultaneously therewith or immediately therebefore, applying light from an original image to said photoconductive layer, wherein said liquid satisfies the relation $\rho \leqq t/Ci \cdot d$, where ρ is the specific resistance of said liquid, Ci is the electrostatic capacity of said insulative layer, d is the thickness of the layer of said liquid, and t is the discharging or charging time; and

the step of removing said non-insulative liquid from said insulative layer and then effecting overall exposure on said photoconductive layer.

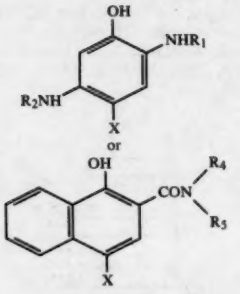
4,222,777

PROCESS FOR FORMING COLOR IMAGES

Yosuke Nakajima; Akira Ushimaru; Shinzo Kishimoto; Yoshio Seoka; Masayoshi Kawai; Naoyoshi Chino; Yoshiyuki Hoshi, and Kazunori Hasebee, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 661,930, Feb. 21, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,196
Claims priority, application Japan, Feb. 28, 1975, 50-24796
Int. Cl.[2] G03C 7/00, 5/38
U.S. Cl. 430—363 22 Claims

1. A process for forming color images, which comprises image-wise exposing a silver halide color radiographic material comprising a support and at least one silver halide emulsion layer, developing the thus image-wise exposed material with a color developer in the presence of a color coupler, and thereafter fixing the developed material with a separate fixing bath having a pH of at least 6 but no greater than about 12, which fixing bath is free of hardening agent, the process being free from a silver bleaching step and including a rinsing after said fixing, wherein the silver halide color radiographic material has been hardened so that the thickness of its coating at the end of the rinsing is not more than 8 times the thickness of the coating in dry form before processing, wherein said color coupler forms a quinone amide dye having a minimum absorption in the spectral wave length region of about 550 to about 700 mμ upon development, said color coupler has the formula:



wherein R_1 and R_2 represent an acyl group derived from substituted or unsubstituted aliphatic carboxylic acids containing 2 to 25 carbon atoms, an acyl group derived from substituted or unsubstituted aromatic carboxylic acids containing 7 to 30 carbon atoms, an acyl group derived from substituted or unsubstituted heterocyclic carboxylic acids containing 1 to 5 nitrogen, oxygen or sulfur atoms either alone or in combination and 2 to 25 carbon atoms, an acyl group derived from substituted or unsubstituted aliphatic sulfonic acids containing 1 to 25 carbon atoms, an acyl group derived from substituted or unsubstituted aromatic sulfonic acids containing 6 to 30 carbon atoms, a sulfonylthienyl group, or an acyl group derived from aryloxy substituted aliphatic carboxylic acids containing 7 to 30 carbon atoms which can be substituted or unsubstituted; R_4 and R_5 represent a hydrogen atom, a substituted or unsubstituted aryl group containing 6 to 30 carbon atoms, or a substituted or unsubstituted alkyl group containing 1 to 25 carbon atoms; and X represents a substituent which can be split off upon coupling with a developing agent, wherein the steps of developing, fixing and rinsing are carried out within 3.5 minutes.

4,222,778

LIQUID SEEDERS FOR ELECTROLESS METAL DEPOSITION

Francis J. Nuzzi, Freeport, and Daniel F. Vitellaro, Huntington Station, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 770,063, Feb. 18, 1977, Pat. No. 4,160,050, which is a continuation of Ser. No. 676,527, Apr. 13, 1976, abandoned. This application Mar. 30, 1979, Ser. No. 25,546
Int. Cl.[3] C23C 3/02
U.S. Cl. 106—1.11 14 Claims

1. A liquid seeder for the catalyzation of a substrate to the electroless deposition of metal, said liquid seeder comprising the admixture of:

(a) a source of cuprous ions;
(b) a source of hydrogen ions;
(c) a source of halogen ions;
(d) at least one organic solvent for said source of cuprous ions, said solvent being present in at least an amount sufficient to solubilize said source of cuprous ions; and
(e) a reducing agent capable of reducing cupric ions to cuprous ions, but incapable of reducing cuprous ions to elemental copper in the environment of said admixture.

4,222,779

NON-CHROMATE CONVERSION COATINGS

Ajay M. Bengali, Hackensack; Richard F. Zuendt, Oradell; John L. H. Allan, Glen Rock, and Philip D. Readio, Sparta, all of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 955,812, Oct. 30, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,160
Int. Cl.[2] C09D 5/08; C23F 7/00
U.S. Cl. 106—14.12 38 Claims

1. A conversion coating solution which comprises an aqueous solution of from about 0.2 g/l to about 45 g/l of free H_2SO_4, from about 1.5 g/l to about 58 g/l of H_2O_2, and from about 3 g/l to about 33 g/l of SiO_2.

4,222,780

ADHESIVE COMPOSITION WITH IMPROVED BONDING AFFINITY FOR HARD HUMAN TISSUES

Kyoichiro Shibatani; Ikuo Omura, and Junichi Yamauchi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 21, 1978, Ser. No. 898,675
Claims priority, application Japan, Apr. 27, 1977, 52-49378
Int. Cl.[3] C09K 3/00; C08F 130/02
U.S. Cl. 106—35 10 Claims

1. An adhesive composition for cementing teeth or bones, comprising

(1) a phosphinic acid compound wherein the substituents on the phosphorus atom occur as follows:

wherein said phosphinic acid compound is a compound of the formula:

wherein R'_1 and R'_2 each represent an organic compound residue containing 1 to 25 carbon atoms and having a molecular weight of up to 500, and at least one of R'_1 and R'_2 contains a vinyl group, or (2) a polymer containing said phosphinic acid

compound as a component unit, wherein said adhesive composition contains 0.1 to 10 weight percent as phosphorus of said phosphinic acid compound.

4,222,781

OPTICALLY CLEAR COPPER HALIDE PHOTOCHROMIC GLASS ARTICLES

David L. Morse, and Thomas P. Seward, III, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 16, 1979, Ser. No. 66,912
Int. Cl.[2] C03C *3/26, 3/08*
U.S. Cl. 106—47 Q **7 Claims**

1. An optically clear photochromic glass article having a composition consisting essentially, in weight percent as calculated from the batch, of about 54–66% SiO_2, 5–15% Al_2O_3, 10–30% B_2O_3, 8–15% total of alkali metal oxides selected from the group consisting of Na_2O, K_2O and Li_2O, 0.5–1.5% total of oxides selected from the group consisting of As_2O_3, Sb_2O_3, and As_2O_5, 0.7–1.5% CuO, 0.1–1.0% Cl, 0.1–1.5% Br, 0–2.5% F and 0–3% total of oxides selected from the group consisting of WO_3 and MoO_3, wherein the molar ratio R, as defined by the expression:

$$R=(R_2O\text{-}Al_2O_3)/B_2O_3$$

wherein R_2O is the total molar concentration of alkali metal oxides in the glass, Al_2O_3 is the molar concentration of aluminum oxide in the glass, and B_2O_3 is the molar concentration of boron oxide in the glass, has a value of at least about 0.3.

4,222,782

REFRACTORY RAMMING MIX CONTAINING ALUMINUM POWDER FOR METAL MELTING FURNACES

Richard A. Alliegro, Holden, and Ronald A. Stark, Hubbardston, both of Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 932,772, Aug. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 842,127, Oct. 14, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,008
Int. Cl.[3] C04B *35/04*
U.S. Cl. 106—57 **3 Claims**

1. A dry refractory ramming or vibration cement for forming monolithic linings in situ in metal furnaces consisting of coarse, intermediate, and fine particles of a crystalline refractory selected from the group consisting of alumina, alumina-chromia, zirconia, spinel, silica, silicon carbide, magnesia-chromia, zircon, mullite, magnesia, and combinations thereof, up to 5% of an intermediate temperature flux, and finely particulate aluminum having a particle size of 10 microns or less sufficiently finely divided to oxidize to alumina in situ during the operation of the furnace, said aluminum being present in an amount insufficient to produce a direct electrical path through the rammed refractory mix, and insufficient to completely fill the pores of the rammed mix upon oxidation to alumina, but being present in an amount at least equal to 0.3% and not more than 3%, by weight, of the mixture solids.

4,222,783

BARIUM TITANATE SERIES CERAMICS HAVING A POSITIVE TEMPERATURE COEFFICIENT OF ELECTRIC RESISTANCE

Senji Atsumi, Kagamihara, and Shigetaka Wada, Kuwana, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 26, 1979, Ser. No. 6,842
Claims priority, application Japan, Feb. 6, 1978, 53-11413
Int. Cl.[2] C04B *35/46*
U.S. Cl. 106—73.32 **3 Claims**

1. Barium titanate series ceramics having a positive temperature coefficient of electric resistance, consisting of
(a) 0.003–0.05 mole of titanium dioxide,
(b) 0.005–0.05 mole of silicon oxide,
(c) 0.003–0.07 mole of aluminum oxide,
(d) 0.0014–0.008 mole of at least one element selected from the group consisting of rare earth elements, yttrium, bismuth, antimony, niobium, tantalum and tungsten,
(e) 0.00025–0.002 mole of at least one element selected from the group consisting of manganese, copper, iron and chromium,
(f) 0.0001–0.003 mole of zinc oxide, and
(g) [1−((a)+(b)+(c)+(d)+(e)+(f))] mole of a barium titanate series compound,
provided that the number of moles given by (d)−((e)+(f)) is 0.001–0.00765 mole.

4,222,784

NOVEL BINDER AND ITS UTILIZATION FOR PREPARING QUICK-SETTING MORTARS AND MICROCONCRETES

Jean-Pierre Caspar, Le Teil Ardeche, and Jacques Gaillard, Villeneuve de Berg Ardeche, both of France, assignors to Lafarge, Paris, France

Filed Nov. 2, 1977, Ser. No. 848,277
Claims priority, application France, Nov. 15, 1976, 76 34248
Int. Cl.[2] C04B *7/353*
U.S. Cl. 106—93 **4 Claims**

1. A binder consisting essentially of 80 to 87% by weight of a Portland cement corresponding to French Standard CPA 400 or CPA 500, 13 to 19% by weight of aluminous cement and 0.01 to 1.0% by weight of an organic rheological and water-retaining agent selected from the group consisting of methylcellulose, carboxymethylcellulose, hydroxyethylcellulose, cellulose ether and cellulose starches, said binder producing on the impact test table a spreading of about 180 to 200 mm three minutes after mixing with water.

4,222,785

BUILDING MATERIAL

Eugene R. Henderson, 3502 Alameda, Baltimore, Md. 21218

Filed Dec. 11, 1978, Ser. No. 968,627
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—97 **12 Claims**

1. A building material compounded from and consisting of:
one part of cement;
a first aggregate consisting of two parts of sand;
a second aggregate consisting of four parts of a coarse aggregate;
a third aggregate consisting of two parts of perlite;
a fourth aggregate consisting of four parts of ash.

4,222,786

FERROCHROMIUM SLAG FOR USES REQUIRING REFRACTORINESS AND MECHANICAL STRENGTH

Frans H. Tuovinen, Ulvila; Matti E. Honkaniemi; Matias A. Virta, both of Tornio, and Helge J. Krogerus, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Apr. 4, 1979, Ser. No. 27,009
Claims priority, application Finland, Apr. 18, 1978, 781180
Int. Cl.[2] C04B *7/14*
U.S. Cl. 106—117 **5 Claims**

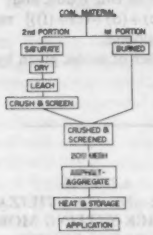
1. A refractory ferrochromium slag with good resistance to mechanical compression and wear, comprising magnesium oxide less than 25% by weight.

4,222,787

ASPHALT MIXTURE

Cyril T. Jones, 14216 N. Bluff Rd., White Rock, B.C., Canada (V4B 3C4)

Continuation-in-part of Ser. No. 804,055, Jun. 6, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,426
Int. Cl.[2] C08L 95/00
U.S. Cl. 106—281 R 29 Claims



1. A method of producing an improved asphalt/aggregate mixture having strong adhesive bonds therebetween, said method comprising the steps of:

a. crushing and screening a low carbon content coal material to produce a quantity of fine particulate coal material having a maximum diameter passing through a 200 mesh screen,

b. burning a first portion of said fine particulate coal material at from 350° F. to 850° F.,

c. expanding the internal and external surface area of a second portion of said fine particulate coal material by exposing said coal material to at least one cycle of wetting and drying,

d. leaching said second portion of said fine particulate coal material with water to remove water soluble and adhering substances therefrom,

e. adding said first and second portions of said fine particulate coal material to an asphalt/aggregate mixture comprising asphalt and non-coal aggregates, said fine particulate coal materials being added in a proportion of at least 50% of said first portion fine particulate coal materials, and

f. heating said mixture,

whereby said asphalt/aggregate mixture completely encapsulates said fine particulate coal material and said non-coal aggregates, materially enhancing the bonding strength between said non-coal aggregates and said asphalt mix.

4,222,788

MIXED PIGMENT AND PROCESS OF PREPARING THE SAME

Egon Liedek, Esslingen; Peter Dimroth, Mannheim; Wolfgang Ruff, Stuttgart; Gerhard Berger, Stuttgart, and Peter Reiter, Stuttgart, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,700
Claims priority, application Austria, Jan. 24, 1978, 518/78
Int. Cl.[2] C09B 63/00
U.S. Cl. 106—289 6 Claims

1. A process for preparing a mixed pigment having an organic pigment component and an inorganic pigment component consisting essentially of a reaction product of titanium dioxide with a color-imparting metal oxide, comprising:

(a) synthesizing the organic pigment component by a chemical reaction in a liquid medium;

(b) admixing said inorganic pigment component with said organic pigment component; and

(c) recovering the purified mixed pigment from the resulting reaction mixture in the dry state.

4,222,789

LIGHT-STABLE TITANIUM DIOXIDE PIGMENT COMPOSITION

Howard W. Jacobson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1978, Ser. No. 965,073
Int. Cl.[2] C04B 31/02; C08K 3/22; C09E 1/36
U.S. Cl. 106—300 12 Claims

1. A pigment composition having the X-ray pattern only of rutile, said composition consisting essentially of from 92% to 99% by weight of TiO_2, from 0.05% to 2% by weight of Al_2O_3 and from 0.1% to 6% by weight of antimony oxide, calculated as Sb_2O_3.

4,222,790

CALCINATION OF FERRITE TANS

Theodore Dickerson, Monroe, La., assignor to Cities Service Company, Tulsa, Okla.

Filed Mar. 23, 1979, Ser. No. 23,479
Int. Cl.[2] C09C 1/24
U.S. Cl. 106—304 6 Claims

1. A method for improving the calcination of ferrite tans comprising, in serial steps,

(a) mixing equivalent amounts of an aqueous slurry of yellow iron oxide monohydrate and an aqueous slurry of metal oxide selected from the group consisting of zinc oxide and magnesium oxide, with the concentration of the oxide in each slurry varying from about 10 to about 25 wt.%,

(b) adding, to the above mixture of slurries, an aqueous solution of an alkali metal silicate selected from the group consisting of sodium silicate and potassium silicate, the amount of added silicate being sufficient to form from about 0.2 wt.% to about 1.0 wt.% SiO_2, based on the dry weight of the final ferrite product,

(c) mixing the materials of step (b),

(d) filtering and drying the mixture of step (c), and

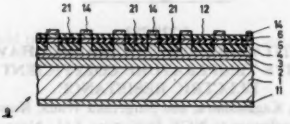
(e) calcining the mixture of step (d).

4,222,791

METHOD OF MAKING HETEROJUNCTION DEVICES BY ACCURATE CONTROL OF GOLD PATTERN MASK AND PROTON BOMBARDMENT

Rudolf P. Tijburg, and Teunis Van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,611
Claims priority, application Netherlands, Jan. 18, 1978, 7800583
Int. Cl.[2] H01S 3/00; H01L 21/225; H01S 3/18
U.S. Cl. 148—1.5 11 Claims



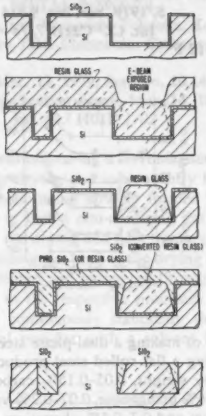
1. A method of manufacturing a device comprising the steps of forming a gold pattern mask of a combination of gold and a relatively small amount of an additive on a surface of a body by photoetching, subjecting said body to a proton bombardment through openings in said gold pattern mask, and removing gold pattern mask after said proton bombardment.

4,222,792

PLANAR DEEP OXIDE ISOLATION PROCESS UTILIZING RESIN GLASS AND E-BEAM EXPOSURE

Reginald F. Lever, Putnam Valley, N.Y.; John L. Mauer, IV, Sherman, Conn.; Alwin E. Michel, Ossining, N.Y., and Laura B. Rothman, Sherman, Conn., assignors to International Business Machines Corporation, N.Y.

Filed Sep. 10, 1979, Ser. No. 73,593
Int. Cl.[2] H01L *21/26, 21/316, 21/76*
U.S. Cl. 148—1.5 7 Claims



1. A planar deep oxide isolation process for providing deep wide silicon dioxide filled trenches in the planar surface of a silicon semiconductor substrate, said process comprising the following steps:

(a) form deep wide trenches in the planar surface of the silicon substrate;

(b) form a thin layer of silicon dioxide on the planar surface of the silicon substrate and the exposed silicon surfaces of said deep wide trenches;

(c) apply resin glass to the planar surface of said semiconductor substrate and within said deep wide trenches;

(d) spin off at least a portion of the resin glass on the planar surface of the substrate;

(e) low temperature bake the substrate;

(f) e-beam expose the resin glass contained within the deep wide trenches of the substrate;

(g) develop resin glass contained on substrate in a solvent;

(h) heat substrate in oxygen to convert resin glass contained within said deep wide trenches to silicon dioxide;

(i) deposit a layer of silicon dioxide to provide a planar silicon dioxide surface on the exposed surface of said substrate; and

(j) planarize said exposed silicon dioxide surface to said silicon of said substrate.

4,222,793

HIGH STRESS NODULAR IRON GEARS AND METHOD OF MAKING SAME

Robert B. Grindahl, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 856,391, Dec. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 772,745, Feb. 28, 1977, abandoned. This application Mar. 6, 1979, Ser. No. 17,840
Int. Cl.[2] C21D *5/00;* C22C *37/00*
U.S. Cl. 148—2 6 Claims

1. A process for making a through hardened, compressively surface stressed nodular iron gear capable of withstanding applied tooth root tensile stress excursions of at least about 60,000 psi without fatigue failure, said process comprising the sequential steps of:

casting a gear blank from nodular iron;

annealing the blank to yield a substantially homogeneous matrix microstructure upon cooling;

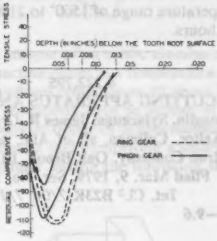
cooling the blank to room temperature;

machining teeth into the blank;

heating the machined casting in a nonoxidizing atmosphere to a temperature of about 1600° F. to about 1700° F. to austenitize the matrix and dissolve sufficient uncombined carbon to provide an austenitic phase comprising about 0.7% to about 1.1% dissolved carbon;

quenching the casting to an isothermal transformation temperature of above about 425° F. and below about 650° F. and at such a rate as to avoid the nose of the time-temperature transformation curve of the nodular iron so as to preclude the formation of significant amounts of pearlite, feathery bainite or martensite prior to and during subsequent isothermal transformation at said quenching temperature;

maintaining the casting at said isothermal transformation temperature for a time sufficient to convert said austenitic phase to at least 50% acicular bainite;



cooling said casting from said isothermal transformation temperature to room temperature; and

shot peening the surface of the gear at the roots of the gear's teeth to impart to said surface a residual compressive stress of at least about 40,000 psi and provide a residual compressive stress of about 10,000 psi at a depth of about 0.006 inch to about 0.015 inch beneath the surface.

4. A through hardened, high stress gear capable of withstanding occasional applied tooth root tensile stress excursions of at least about 60,000 psi, said gear comprising a base portion and a plurality of teeth integral with and extending from said base portion, said teeth each comprising a central core and a skin cold worked by impingement on said core at least at the tooth's root where it joins the base, said base, core and skin comprising nodular iron the matrix of which comprises at least about 50% by weight non-feathery acicular bainite having a dissolved carbon content of about 0.7% to about 1.1% by weight and a Vickers hardness between about 577 and 720, and said skin having a residual compressive stress of at least about 40,000 psi at its surface and about 10,000 psi at a depth between about 0.006 inch and 0.015 inch below said surface.

4,222,794

SINGLE CRYSTAL NICKEL SUPERALLOY

Frederick A. Schweizer, East Hartford, and David N. Duhl, Newington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1979, Ser. No. 54,086
Int. Cl.[2] C22F *1/10*
U.S. Cl. 148—3 2 Claims

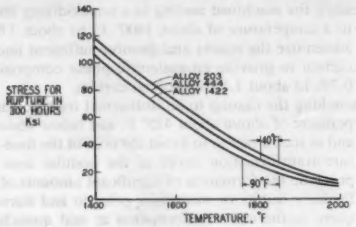
2. A method for producing a single crystal super-alloy article, suited for use as an element in a gas turbine engine, which consists of:

a. providing a composition consisting essentially of 4.5 to 6% Cr, 5.0 to 5.8% Al, 0.8 to 1.5% Ti, 1.7 to 2.3% Mo, 4

to 6% W, 5.5 to 8% Ta, 1 to 5% Re, 0.2 to 0.6% V, 0 to 7% Co, balance essentially nickel;

b. melting and directionally solidifying the composition to produce a single crystal article;

c. heat treating the article between about 2445° and 2465° F. for from about 1 to 10 hours;



d. cooling the article;

e. reheating the article to at least one temperature between about 1500° and 2100° F. and holding the article within the temperature range of 1500° to 2100° F. for from about 2 to 50 hours.

4,222,795

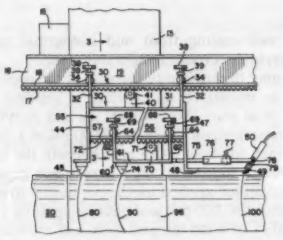
PIPE CUTTING APPARATUS AND METHOD

Harold B. Hoaglin, Sylacauga; James R. Grill, Birmingham, and Jack H. Keller, Cullman, all of Ala., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 9, 1979, Ser. No. 18,925

Int. Cl.[2] B23K 7/04, 7/10

U.S. Cl. 148—9.6 **7 Claims**



1. Apparatus in combination comprising:

a horizontally positioned and movable member,

roller means to support and axially rotate a horizontal pipe parallel to the member,

a photocell scanner mounted on the member and positioned to follow a profile template circumscribing a pipe on the roller means,

drive means, responsive to a signal from the photocell scanner, adapted to move the member horizontally in either axial direction as the photocell scanner follows the profile template,

a cutting torch pivotally supported by a mounting on the member and positioned to cut through a pipe, rotating axially on the roller means, in a cutting path having the same profile as the template,

a support on the member movable axially of a pipe on the roller means,

a second photocell scanner mounted on the movable support and positioned to follow a bevel contour template circumscribing a pipe on the roller means,

an arm extending from the support and pivotally connected with the cutting torch, and

drive means, responsive to a signal from the second photocell scanner, adapted to move the support and arm in either axial direction as the said photocell scanner follows the bevel contour template thereby orienting the cutting torch at an angle to cut a pipe wall with a bevel.

4,222,796

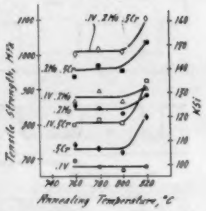
HIGH STRENGTH DUAL-PHASE STEEL

Richard G. Davies, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 957,375, Nov. 2, 1978. This application Feb. 5, 1979, Ser. No. 9,314

Int. Cl.[3] C21D 7/14

U.S. Cl. 148—12 F **5 Claims**



1. A method of making a dual-phase steel comprising:

(a) hot-forming a flat rolled steel product consisting essentially of, by weight, 0.05–0.15% carbon, 0.25–1.0% silicon, 1.2–1.6% manganese, 0.07–0.2% vanadium, 0.1–0.2% molybdenum and 0.3–0.5% chromium,

(b) heat said product to the insensitive portion of the intercritical annealing temperature range generally equivalent to 740°–830° C., permitting the carbon of said steel to be segregated in solution so as to be constituted of dual-phases comprises of austenite and ferrite, said austenite constituting 30–40% by volume of said heated product,

(c) cooling said heat product at a rate of less than 100° C. per second to room temperature to convert substantially all of the austenite to martensite.

4,222,797

METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO ALUMINUM ALLOYS HAVING PRECIPITATING CONSTITUENTS

C. Howard Hamilton, Thousand Oaks; Murray W. Mahoney, Camarillo, and Neil E. Paton, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 30, 1979, Ser. No. 62,203

Int. Cl.[2] C22F 1/04

U.S. Cl. 148—12.7 A **2 Claims**

1. An improvement in a method of imparting a fine grain structure to an aluminum alloy having a precipitating constituent, said method having steps of:

providing an aluminum alloy having a precipitating constituent;

dissolving at least some of said precipitating constituent in said alloy by heating said alloy to a solid solution temperature;

cooling said alloy to a temperature below said solid solution temperature;

overaging said alloy to form precipitates;

plastically straining said alloy; and

recrystallizing said alloy by heating it above the minimum recrystallization temperature, whereby said precipitates form nuclei for the recrystallization and controlled growth of a fine grain structure;

said improvement being characterized in that said step of plastically straining said alloy comprises:

heating said alloy to a temperature in the range of 380° F. to

450° F. and reducing its cross-sectional area a total of 40% minimum, at least 25% of the reduction in area being accomplished in a single continuous deformation operation.

4,222,798

METHOD OF MANUFACTURING FERROMAGNETIC METAL POWDER

Minoru Yoda, Saku, and Yasumichi Tokuoka, Komoro, both of Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 20,144
Claims priority, application Japan, Mar. 14, 1978, 53-28205
Int. Cl.² H01F 1/02
U.S. Cl. 148—105 4 Claims

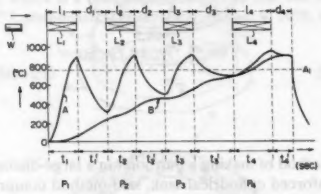
1. A method of manufacturing a ferromagnetic metal powder by continuously drying and subsequently heat treating a slurry of ferromagnetic metal powder formed by wet reduction, characterized in that a non-oxidizing gas is supplied in separate streams to the drying and heat treating processes, the streams of non-oxidizing gas used in the drying and heat treating processes are treated and recovered through separate circuits for recycling to the respective processes of drying and heat treating, and continuously stabilizing the heat-treated ferromagnetic metal powder with a solvent for preventing oxidation.

4,222,799

HIGH-STRENGTH SPRING STEEL AND ITS MANUFACTURING PROCESS

Toshio Hijikata; Takao Yamazaki, both of Fujisawa, and Kiyohiko Fujita, Kasugai, all of Japan, assignors to Neturen Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,561
Int. Cl.² C21D 1/18
U.S. Cl. 148—143 4 Claims



3. A process of manufacturing high-strength spring steel having high toughness and resistance to fatigue which steel is characterized by fine grains which are increasingly finer from the core to the surface of the steel whereby the topmost layer has an extraordinarily fine grain structure and which spring steel has a strength distribution matching the bending or torsion stresses therein under service conditions comprising the steps of:

heating the surface of the steel to over the AC_3 transformation point by high-frequency induction for a short time;

ceasing the heating and thereby lowering the surface temperature of the steel to below the Ar_1 transformation point by a self-cooling action due to its own heat conductivity;

this short-time surface heating cycle being repeated more than two times to secure heating of the steel throughout the entire steel body or to bring about a condition close to it;

and then quenching the steel.

4,222,800

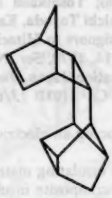
ISOMERIZATION OF ENDO-ENDO HEXACYCLIC OLEFINIC DIMER OF NORBORNADIENE

Harry K. Myers, Jr., Aston, and Abraham Schneider, Overbrook Hills, both of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Nov. 30, 1978, Ser. No. 964,855
Int. Cl.² C06B 23/00
U.S. Cl. 149—109.6 12 Claims

1. Process for the isomerization of an olefinic endo-endo hexacyclic dimer of norbornadiene comprising:

a. contacting a hexacyclic dimer having the following structure:

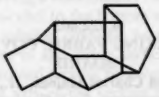


with a catalytic amount of an acidic alumina catalyst; and

b. having the contacting occur at a temperature in the range from about an ambient temperature to about 300° C.; and

c. continuing the contacting until an isomer of the olefinic endo-endo hexacyclic dimer of norbornadiene is formed.

9. An improved missile fuel comprising a saturated isomerized norbornadiene dimer having the following structure:

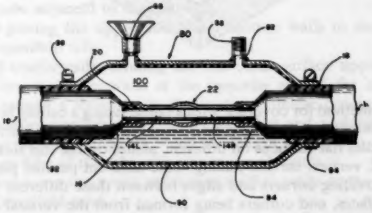


4,222,801

HIGH VOLTAGE CABLE SPLICING-CONDENSATION REACTION

Marvin H. Gold, 5050 Dory Way, Fair Oaks, Calif. 95628

Filed Feb. 1, 1978, Ser. No. 874,105
Int. Cl.² H02G 1/14; H01R 43/00; H01B 3/30; B21F 15/02
U.S. Cl. 156—49 15 Claims



1. A process for preparing a splice of two sections of high voltage cable; each of which comprises a conductor portion and original electrical insulation surrounding said conductor portion, the conductor position having an exposed end protruding beyond the end of said insulation, said process comprising:

a. electrically and mechanically joining the exposed ends of said conductor portions to form a conductor,

b. providing semi-conductive material about the electrical junction,

c. surrounding the joined section with a mold,
d. filling the mold with a mixture comprising a liquid polyolefin having pendent groups capable of entering into a condensation reaction, a chain extension agent reactive with said pendent groups, a particulated solid, saturated polyolefin,
e. heating the mold to a temperature to effect chain extension of at least the liquid polyolefin, and
f. raising the temperature to effect polymeric grafting of the chain extended liquid polyolefin onto the solid polyolefin and the cable insulation.

4,222,802

PROCESS FOR PRODUCING ELECTRIC WINDINGS

Masahiko Sakai, Hitachi; Toshikazu Narahara, Naka; Toru Koyama, Hitachi; Shinichi Toyoda, Katsuta, and Kazuo Goto, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 14, 1979, Ser. No. 38,424
Claims priority, application Japan, Jun. 2, 1978, 53-65753
Int. Cl.[2] H01B *13/06*
U.S. Cl. 156—53 **8 Claims**

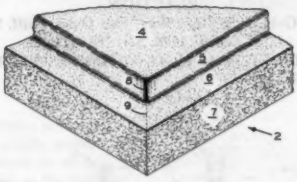
1. A process for producing an electric winding which comprises
wrapping a composite insulating material around an electrical conductor, said composite insulating material having been obtained by bonding two or more insulating materials with a silicone resin containing hydroxyl groups in the molecular structure,
impregnating said wrapped composite insulating material with an insulating varnish comprising 1 equivalent of polyfunctional epoxy compound and 2.5 to 25 equivalents of a polyfunctional isocyanate compound, and
curing the resulting impregnated composite insulating material.

4,222,803

METHOD OF MAKING FABRIC COVERED CEILING BOARD

Raymond C. Kent, and Charles Haines, Jr., both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 5, 1978, Ser. No. 912,550
Int. Cl.[2] B29C *27/14, 27/22*
U.S. Cl. 156—85 **2 Claims**



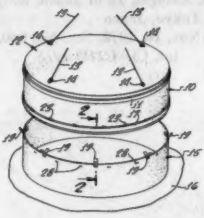
1. A method for covering with a fabric facing a ceiling board with four sides, a top and bottom, said board having a plurality of parallel flat surfaces on different planes on the top surface thereof, vertical surface joining these different parallel planes and providing corners and edges between these different planar surfaces, said corners being formed from the vertical and planar surfaces so that the fabric facing needs to be stretched or shrunk at different points when the fabric is shaped to the overall contour of the flat surface and edges of the four sides of the ceiling board, the method comprising the steps of:
(a) placing a heat shrinkable and heat stretchable fabric facing material on the top surface of the ceiling board preformed with flat surfaces on different planes with the fabric being of a size greater than the top surface area of the ceiling board and an adhesive between the fabric and the board,
(b) positioning said ceiling board and fabric facing in a heated mold which has a mold cavity with the walls of the cavity shaped to the contour of the surfaces and edges of the ceiling board, said walls of the cavity having at least two planar parallel surface joined together by at least two vertical surfaces to form at least one corner, and
(c) pressing said mold cavity walls against said ceiling board with said fabric facing so that by said pressing the fabric facing is pressed down against at least said two planar surfaces, at least said two vertical surfaces and their corresponding edge configuration and, by heat, said fabric is stretched at some points and shrunk at other points to mold said fabric to the contour of said ceiling board so that the fabric assumes the configuration of the surfaces, corners, and edges of the ceiling board without the existence of any wrinkles or gathers in the fabric molded to the ceiling board and the fabric is adhesively held to the ceiling board.

4,222,804

METHOD OF JOINING TOGETHER THE SECTIONS OF LARGE-DIAMETER FIBERGLASS-REINFORCED TANKS

Robert J. Short, Laguna Beach, Calif., assignor to Tankinetics, Inc., Westminster, Calif.

Filed May 31, 1978, Ser. No. 911,074
Int. Cl.[2] B32B *31/04, 31/12*
U.S. Cl. 156—182 **19 Claims**



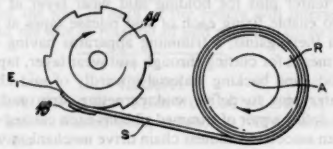
1. A method of making a butt joint in a large-diameter fiberglass-reinforced cylindrical tank, said method comprising:
(a) providing two cylindrical tank sections each having substantially the same large diameter and each formed of fiberglass-reinforced synthetic resin,
the diameter of each of said sections being sufficiently great, and the wall thickness sufficiently small, that the sections may be greatly oblated for shipment prior to making of the butt joint,
said tank sections having diameters in the range of about 8 feet to about 60 feet,
(b) disposing said sections in axial alignment, with the end of one of said sections adjacent the end of the other,
(c) disposing a joint element radially adjacent both of said ends in straddling relationship thereto,
(d) causing said joint element, and the surfaces of said ends which are opposite said joint element, to define between them an annulus extending around the tank, and
(e) substantially filling said annulus with synthetic bonding resin, thus joining said tank sections with each other and with said joint element.

4,222,805

PLASTIC DUST TUBE FOR SHOCK ABSORBER AND METHOD OF MANUFACTURE

Elgin J. Karklins, and Charles W. Spindler, both of Kettering, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 856,842, Dec. 2, 1977, Pat. No. 4,167,991.
This application Mar. 26, 1979, Ser. No. 23,583
Int. Cl.[2] B65H 8/00
U.S. Cl. 156—184 2 Claims



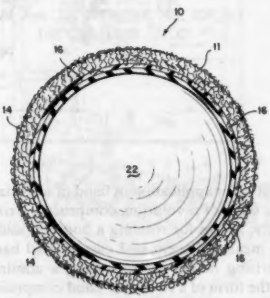
1. A method of making a dust tube for a shock absorber comprising the steps of forming an annular cover plate with a series of arcuately spaced teeth projecting radially from the periphery thereof, providing a sheet of flexible plastic material of predetermined length and width, forming a plurality of openings along one edge of said sheet spaced by an amount equal to the arcuate spacing between said teeth and with each opening sized to accommodate a corresponding one of said teeth, inserting one of said teeth into one of said openings, winding said sheet onto said cover plate and serially inserting the other of said teeth through the other of said openings of said sheet to thereby form said sheet into a cylinder, and securing adjacent side edge portions of said cylinder to each other to thereby secure said dust tube to said cover plate to complete said dust tube.

4,222,806

METHOD OF COVERING TENNIS BALLS

Roy B. Parker, Monmouth, Mass., assignor to Albany International Corp., Albany, N.Y.

Continuation-in-part of Ser. No. 914,257, Jun. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,254, Jul. 27, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,206
Int. Cl.[2] B29C 17/04
U.S. Cl. 156—213 2 Claims



1. A method of adhering a textile tennis ball cover to a tennis ball core, which comprises;

providing a tennis ball core;

providing a textile tennis ball cover of a cut, dimension and configuration to cover said core, said textile comprising a fabric including yarns fabricated from a hot-melt adhesive composition;

assembling said cover on said core;

causing said adhesive yarns to melt and form a bond between said core and said cover; and

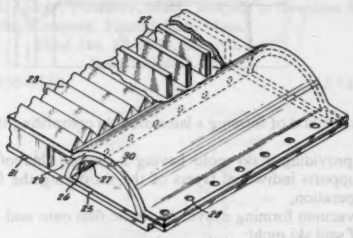
allowing said melt to solidfy, whereby said cover is adhered to said core.

4,222,807

RIDGED SURFACE SOLAR HEATER

Joseph Farber, 1605 Sherington Pl., Newport Beach, Calif. 92663

Division of Ser. No. 693,702, Jun. 7, 1976, Pat. No. 4,120,286.
This application Oct. 16, 1978, Ser. No. 951,331
Int. Cl.[2] F24J 3/02
U.S. Cl. 156—244.13 1 Claim



1. The process of fabricating an apparatus adapted to heating fluid by absorption of radiant energy and cooling fluid by radiation and convection comprising:

(a) longitudinally extruding from a plastic material a uniform cross-section having a substantially flat bottom surface, an upper surface parallel to the bottom surface, and a plurality of parallel tubular channels longitudinally disposed between the bottom and upper surface,

(b) cutting the extruded section transversely at either end of the longitudinal axis of the section to form a section of desired length,

(c) severing to the desired longitudinal depth from each end the interior of the extruded section flush with the insides of the parallel upper and lower wall surfaces,

(d) removing the severed interior section material from both ends of the section,

(e) conformally bending the flat inner surface upper and lower section walls at one end of the section around a transversely-disposed curvilinear cross-section inlet manifold tube having an inlet and a plurality of output holes disposed along the length of tube on the surface of the tube adjacent to the channels,

(f) joining the upper and lower section walls to the inlet manifold tube,

(g) conformally bending the flat inner surface upper and lower section walls at the opposite end of the section around a transversely disposed curvilinear cross-section outlet manifold tube having an outlet and a plurality of input holes disposed along the length of the tube on the surface of the tube adjacent to the channels,

(h) joining the upper and lower section walls to the outlet manifold tube,

(i) sealing the space between the section walls and inlet and outlet tubes,

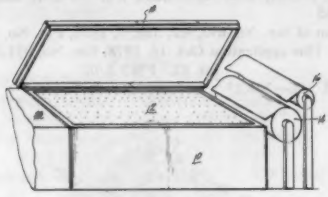
(j) sealing the end of the inlet tube transversely opposed to the inlet opening,

(k) sealing the end of the outlet tube transversely opposed to the outlet opening, and (1) extending the slit upper and lower wall sections longitudinally beyond the outside edges of the manifold tubes and fastening the extended wall sections together in lap joints to comprise mounting flanges disposed along the outside edges of the inlet and outlet manifold tubes.

4,222,808
SKI MANUFACTURING PROCESS

Charles R. Hale, Glastonbury; Vincent E. Toloczko, Thompson; Robert C. Gammons, Southington; Frederick J. Eckert, Branford, and John J. Muller, Middletown, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 7, 1979, Ser. No. 10,181
Int. Cl.[3] B29C *19/00, 17/00;* B65C *9/25;* B29C *1/04*
U.S. Cl. 156—245 2 Claims



1. A method of forming a laminated ski comprising the steps of:

(a) providing a ski mold having a portion thereof which supports individual layers of the ski during the forming operation;

(b) vacuum forming a layer of plastic film onto said portion of said ski mold;

(c) positioning various components of the ski on said vacuum-wrapped portion of said ski mold, at least some of said components being pre-coated with thermo-setting adhesive, until a ski pre-assembly has been formed on the mold;

(d) subjecting said mold and ski pre-assembly to heat and pressure to form a contoured ski pre-assembly and set the adhesive under conditions wherein an excess of the adhesive is expressed from the ski pre-assembly into contact with said plastic film layer;

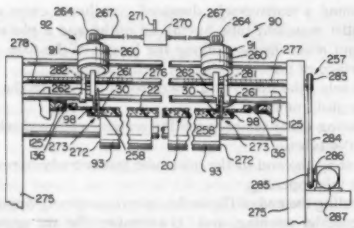
(e) separating said mold from the contoured ski pre-assembly whereby said plastic film layer adheres to said contoured ski pre-assembly; and

(f) removing said plastic film layer from said contoured ski pre-assembly.

4,222,809
APPARATUS FOR AND METHOD OF REMOVING SCRAP RIBBONS TRIMMED FROM A CARPETING STRIP

Michael E. McLean; Rufus N. Ensley, both of Waynesville, N.C.; Anthony J. Alcaraz, Petersburg, and Paul E. Caldwell, Dewitt, both of Va., assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 10, 1979, Ser. No. 28,785
Int. Cl.[2] B32B *31/00;* B26D *7/06*
U.S. Cl. 156—267 20 Claims

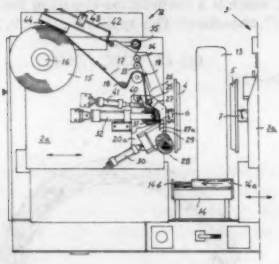


1. In an apparatus for continuously making a carpeting strip having integral joining means; said apparatus comprising means for continuously moving a wear layer having a bottom surface and opposed side edges in a rectilinear path; a pair of devices for fixing a pair of release tapes against said bottom surface; each of said devices fixing its release tape adjacent an associated side edge portion of said wear layer employing an adhesive band between each release tape; and said bottom means forming a compressible backing material against said bottom surface and against said tapes so that each of said tapes isolates a portion of said backing material from said wear layer and is sandwiched therebetween; a tenter assembly defined as a part of said moving means; said tenter assembly having a pair of endless chain drive mechanisms comprised of a plurality of chain links having tenter pin plates fixed thereto; each pin plate having tenter pins for holding said wear layer at a precise width to enable fixing each of said release tapes at a precise location thereagainst; a trimming apparatus having a pair of cutting means for cutting through said wear layer, tapes, adhesive bands, and backing material inwardly of said chain links and tenter pins to define said carpeting strip and simultaneously define a pair of trimmed ribbons each carried on tenter pins of an associated endless chain drive mechanism with each ribbon having exposed adhesive along the edge thereof cut by its cutting means; and apparatus for stripping said ribbons from said tenter pins; the improvement in said stripping apparatus comprising, a stripping device having a pair of cooperating rotatable rollers consisting of an upper roller and a lower roller, means yieldingly urging at least one of said rollers toward the other roller to enable clamping said ribbons therebetween and pulling thereof therethrough with rotation of said rollers, and a trough containing a liquid for bathing the lower portion of said lower roller, said liquid serving to prevent sticking of each ribbon against said rollers even with said exposed adhesive along its cut edge.

4,222,810
APPARATUS FOR APPLYING A BAND OF MATERIAL TO THE SIDE OF A CIRCULAR BODY OF REVOLUTION

Gunnar E. Ytterström, Alingsas, Sweden, assignor to Aktiebolaget Stabil Mekaniska Verkstad, Alingsas, Sweden

Filed Mar. 27, 1978, Ser. No. 890,311
Claims priority, application Sweden, Apr. 5, 1977, 7703984
Int. Cl.[2] B29H *17/10*
U.S. Cl. 156—405 R 8 Claims



1. Apparatus for application of band of material onto the side of a circular body of revolution, comprising: a rotatable carrier for said body; means for rotating a body on said carrier; band applciation means adjacent said carrier, said band application means comrising means for supplying a continuous band of material in the form of a two layer band comprising a first band of material for application to the side of said body and a protective foil covering a surface of said band, means for guiding said two layer band from said supply means to said body and a protective foil covering a surface of said band, means for guiding said two layer band from said supply means to said body for application of said first band onto a side of said body, means for pressing said first band onto the side of said body while said body is rotating and means for cutting off said first band after application of said first band of material to the side

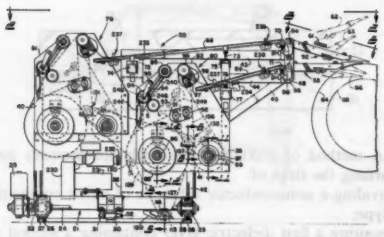
of a body, said guide means comprising a guide member for said two layer band positioned close to the location where said first band is applied to the side of said body and around which guide member the protective foil is drawn; and driven roller means for postively engaging the protective foil to separate said protective foil from said first band and to provide a feeding of the two layer band from said supply means for application to said body, said means for pressing said first band onto the side of said body comprising a first freely rotatable brush roller and a second, freely rotatable brush roller, and means for mounting each of said first and second rollers at an angle to the plane of rotation of said rotatable carrier and such that an extension of the axis of each of the rollers will intersect an extension of the axis of rotation of said rotatable carrier.

4,222,811

SERVICER FOR A TIRE BUILDING DRUM

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Mar. 15, 1978, Ser. No. 886,744
Int. Cl.[2] B29H *17/20*
U.S. Cl. 156—406 32 Claims



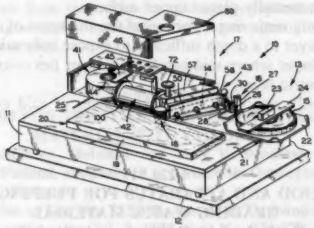
1. A tire component servicer including means to convey the component to an air flotation tray, centering guide means on said air flotation tray, said guide means comprising component edge contacting means, and substantially constant force spring motor means urging said edge contacting means uniformly symmetrically toward the center line of said tray.

4,222,812

HOT AIR EDGE BANDING MACHINE

Ronald E. Duewel, West Dundee, Ill., assignor to LOF Plastics, Inc., Detroit, Mich.

Filed Jun. 29, 1978, Ser. No. 920,241
Int. Cl.[2] B32B *35/00*
U.S. Cl. 156—497 9 Claims



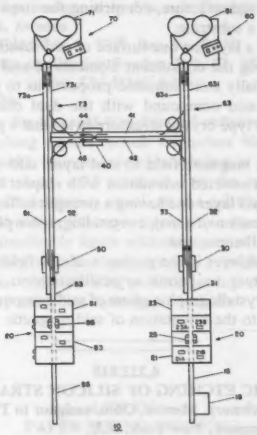
1. In apparatus for applying a continuous decorative band of material having a hot melt adhesive coating on a surface thereof to the edges of a panel, comprising a working deck upon which the panel rests for manual manipulation in applying the band, means providing a continuous supply of the band, means for severing a section of the band from the continuous supply, means for selectively directing heated air against the adhesively coated surface of said band for melting said adhesive, including a heater through which air is blown and a heating chamber receiving the heated air, said heating chamber comprising a bypass section, a working section through which said band passes, and damper means for selectively directing the heated air to either of said sections, and spindle means past which the panel edge and band are moved for aligning and pressing the band against the panel edge while the adhesive is melted, said spindle including means defining a working recess of adjustable height to accommodate panels of different thicknesses.

4,222,813

BOTTLE TRANSPORT SYSTEM

Robert M. Jodrey, Westboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jan. 22, 1979, Ser. No. 5,417
Int. Cl.[2] B44C *1/00*
U.S. Cl. 156—540 13 Claims



1. Apparatus for handling bottles and other objects, comprising:

a single lane input conveyor, which transports objects sequentially;

means for dividing objects transported on said input conveyor into first and second groups, and for further sequentially transporting objects in each group in a separate lane;

crossover means having laterally adjacent first and second input lanes, for routing objects in the first input lane to a first output lane, and for routing objects in the second input lane to a second output lane, said output lanes being laterally adjacent, wherein the relative position of the first input lane with respect to the second input lane is the reverse of the relative position of the first output lane with respect to the second output lane;

single lane conveyor means for transporting objects in the first group from the dividing means to a first processing station, and from said first processing station to the first input lane of the crossover means;

single lane conveyor means for transporting objects in the second group from the dividing means to the second input lane of the crossover means;

combining means having first and second infeed lanes, for combining objects on said infeed lanes in a single outfeed lane;

single lane conveyor means for transporting objects in the second group from the second output lane of the crossover means to a second processing station, and from the

second processing station to the second input lane of the combining means;

single lane conveyor means for transporting objects in the first group from the first output lane of the crossover means to the first infeed lane of the combining means; and

a single lane output conveyor, which transports objects sequentially from the outfeed lane of the combining means.

4,222,814

METHOD FOR FORMING A CRYSTALLINE FILM FOR A PARAMAGNETIC SODIUM THALLIUM TYPE INTERMETALLIC COMPOUND

Norman E. Reitz, Redwood City, Calif., assignor to Sotek Corporation, Palto Alto, Calif.

Filed Jan. 26, 1978, Ser. No. 872,625
Int. Cl.[2] B01J *17/06, 17/30*
U.S. Cl. 156—612 28 Claims

1. A method for forming a crystalline film of a paramagnetic sodium thallium type intermetallic compound having a dual diamond crystal structure, comprising the steps of:

providing a substrate;

producing a layer on one surface of said substrate, said layer containing the constituent elements of said compound in substantially stoichiometric proportions to permit formation of said compound with the dual diamond sodium thallium type crystal structure in at least a portion of said layer;

applying a magnetic field to said layer, said magnetic field having a selected orientation with respect to the orientation of said layer and having a strength sufficient to induce crystallization of a major crystallographic plane in aligned relation thereto; and

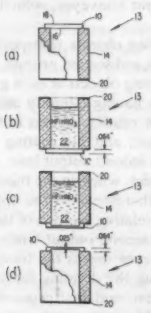
heating said layer in the presence of said field at a sufficient temperature to permit crystallization to occur with a major crystallographic plane of said compound in aligned relation to the orientation of said magnetic field.

4,222,815

ISOTROPIC ETCHING OF SILICON STRAIN GAGES

Roger L. Krechmery, Mentor, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,499
Int. Cl.[2] G01L *1/22;* H01L *21/308*
U.S. Cl. 156—630 5 Claims



1. A method of etching a silicon diffused resistance pressure transducer comprising the steps of:

providing a tubular support base of glass material;

mounting a silicon diffused resistance pressure transducer on one end of said tubular support base with the diffused resistors on the side opposite the side mounted to said tubular support base;

maintaining a volume of active isotropic etchant solution on the mounted side of said silicon diffused resistance pressure transducer for a predetermined time; and

removing said isotropic etchant solution from said silicon diffused resistance pressure transducer after said predetermined time to prevent further etching and to provide a silicon diffused resistance pressure transducer having a desired thickness in the area of the diffused resistors.

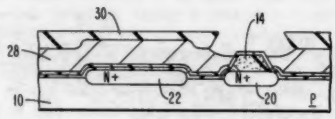
4. A method as set forth in claim 1 wherein the end of said tubular support base opposite said silicon diffused resistance pressure transducer is metallized prior to filling said tubular support base with an isotropic etchant to prevent the etching of that surface of said base.

4,222,816

METHOD FOR REDUCING PARASITIC CAPACITANCE IN INTEGRATED CIRCUIT STRUCTURES

Wendell P. Noble, Jr., Milton, Vt., and Richard A. Unis, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,219
Int. Cl.[2] H01L *21/225, 21/308*
U.S. Cl. 156—643 10 Claims



9. A method of making a semiconductor memory device comprising the steps of:

providing a semiconductor substrate of a first conductivity type;

depositing a first dielectric layer containing a second conductivity type dopant on a surface of said substrate and patterning said dielectric layer to define at least two regions of said substrate in which conductive regions of opposite conductivity type are desired;

causing said second conductivity type dopant to diffuse from said patterned dielectric layer to form at least two regions of said second conductivity type in said substrate;

selectively removing at least some of said patterned layer from said substrate, while retaining at least some of said patterned layer;

providing a second dielectric layer over at least those regions of said substrate not containing retained regions of said patterned layer, said second dielectric layer being thinner than said first dielectric layer;

providing a conductive layer of substantially uniform thickness over said first and second dielectric layers;

applying a masking layer over said conductive layer having a substantially planar upper surface;

uniformly removing a portion of the thickness of said masking layer to a depth sufficient to expose only said conductive layer where said conductive layer lies over said first dielectric layer; and

selectively removing exposed portions of said conductive layer.

4,222,817

METHOD AND APPARATUS FOR PULPING AND GRADING WASTE MATERIAL

Llewellyn E. Clark; John B. Matthew, both of Pittsfield, and Bruce E. Nunn, Middlefield, all of Mass., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 756,357, Jan. 3, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,943
Int. Cl.[2] D21B *1/32*
U.S. Cl. 162—4 16 Claims

1. An apparatus for pulping and grading waste material,

particularly for the pulping and grading of waste paper, said apparatus comprising:

a cylindrical chamber having a first end wall, a second end wall, a cylindrical wall and a central axis extending through said chamber and both end walls thereof;

a perforate area disposed in said first wall and spaced a limited distance from said cylindrical wall;

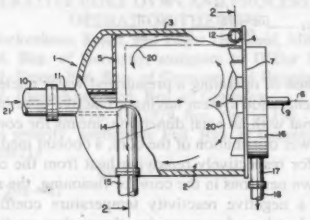
a single impeller only in said chamber adjacent said perforate area and having its rotational axis coincident with said central axis to provide rotational motion of the waste material in the chamber about the central axis concurrently with movement of said material radially outwardly adjacent to said perforate area and back toward said second wall;

means to supply material to said chamber comprising inlet means disposed centrally in said second end wall;

means to remove lightweight rejects from said chamber comprising a first outlet means disposed in said cylindrical wall;

means to remove heavy rejects from said chamber comprising:

a second outlet means disposed adjacent said second wall; and



means providing a takeoff chamber to receive a stream of accepted material passing through said annular perforate area.

10. In a method of pulping and grading waste paper for use in making paper and the like in a separator unit of the type having a chamber defined by a cylindrical wall, a first end wall having a perforate screen and a second end wall opposite said first end wall and further including one impeller only in said chamber adjacent said first wall to provide rotational movement of said material concurrently with movement of said material radially outwardly in the area of said impeller and back toward said first wall, the improvement comprising:

introducing waste paper through an inlet in the axial center of said second end wall;

removing heavy rejects from an outlet in said chamber in an area near said second end wall;

removing lightweight rejects through an opening in said chamber which is disposed in said cylindrical wall and is separate from the outlet for said heavy rejects; and,

removing accepted material which passes through said perforate screen.

4,222,818

METHOD FOR TREATMENT OF LIGNOCELLULOSIC MATERIAL WITH CHLORINE

Johan Gullichsen, Helsinki, and Frey V. Sundman, Karhula, both of Finland, assignors to A. Ahlstroom Osakeyhtio, Noormarkku, Finland

Continuation of Ser. No. 783,863, Apr. 1, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,370

Claims priority, application Finland, Apr. 28, 1976, 761171

Int. Cl.[2] D21C *9/12, 9/14*

U.S. Cl. 162—66 **8 Claims**

1. A method of treating pulp containing lignocellulosic fibres with chlorine, to obtain 92% delignification consisting of a first step of mixing chlorine in a gaseous state into the pulp and permitting it to react with the lignin in the fibres to form reaction products containing chlorinated lignin and thereafter in a second step removing the reaction products containing chlorinated lignin by displacing the liquid in the pulp with a chlorine solution, the consistency of the pulp in both steps being the same and being 6–12%, the amount of chlorine gas which is mixed with the pulp in the first step being 0.6–1.0 g per gram of lignin, the amount of chlorine being used in the first step being consumed totally, and the reaction with chlorine gas taking place for a period of 5–15 minutes, the amount of active chlorine in the solution in the second step being 0.9 grams–0.3 g per gram of the lignin initially present in the pulp, the total amount of chlorine being 0.7–1.2 g per gram of lignin.

4,222,819

PROCESS FOR THE ACID BLEACHING OF CELLULOSE PULP WITH PEROXIDES

Greta K. Fossum, Domsjo, and Sten L. Haggstrom, Overhornas, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Feb. 5, 1979, Ser. No. 9,200

Claims priority, application Sweden, Feb. 17, 1978, 7801868

Int. Cl.[2] D21C *9/16*

U.S. Cl. 162—76 **28 Claims**

1. A process for the acid bleaching of cellulose pulp with peroxide bleaching agents which comprises bleaching the cellulose pulp with aqueous peroxide solution at a pH within the range from about −0.5 to about 3 in the presence of a complexing agent inhibiting attack on the cellulose, and then immediately subjecting the treated pulp to an aqueous alkaline extraction of dissolvable lignin without intermediate washing, thereby obtaining cellulose pulp having a brightness corresponding to that obtained with peroxide at higher pH's and a higher viscosity using less hydrogen peroxide.

4,222,820

PAPER SIZING AGENTS

Ian R. Hiskens; David C. Johnson, and Michael J. Caudwell, all of Bristol, England, assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

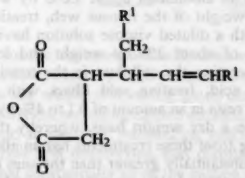
Filed Jun. 21, 1978, Ser. No. 917,629

Claims priority, application United Kingdom, Jun. 28, 1977, 27090/77

Int. Cl.[2] D21H *3/08*

U.S. Cl. 162—158 **29 Claims**

1. A method of sizing paper, which comprises dispersing within wet paper pulp, or, after conversion of such pulp into paper treating the resultant web with, a sizing agent which comprises an emulsion in an aqueous medium containing at least one compound selected from the group consisting of long-chain succinic anhydride derivatives prepared from maleic anhydride and a polymer of butadiene in the presence of an antioxidant and having the general formulae:



and

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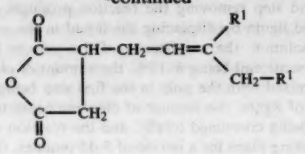
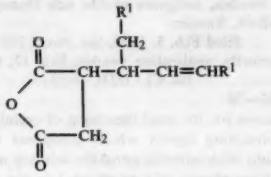
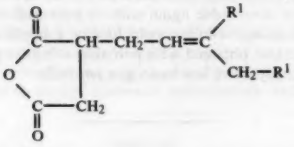


wherein each R^1 represents a hydrophobic alkenyl group, where the R^1 groups in either formula may be the same or different and together they contain from 25 to 60 carbon atoms.

21. A paper sizing agent having improved hydrolytic stability which comprises an aqueous emulsion of at least one compound selected from the group consisting of long-chain succinic anhydride derivatives prepared from maleic anhydride and a polymer of butadiene in the presence of an antioxidant and having the general formulae:



and



wherein each R^1 represents a hydrophobic alkenyl group, where the R^1 groups in either formula may be the same or different and together they contain from 25 to 60 carbon atoms.

4,222,821

CASING PAPER HAVING ALKALI RESISTANCE

Newlyn Jones, Berwick-Upon-Tweed, England; Alistair C. Stewart, Duns, Scotland, and Colin Elston, Windsor, Conn., assignors to C. H. Dexter Limited, United Kingdom

Continuation-in-part of Ser. No. 749,353, Dec. 10, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,116

Int. Cl.[2] **D21H** *3/58*

U.S. Cl. 162—164 R **12 Claims**

1. A process for the production of casing base paper of improved alkaline wet tensile strength suited for the subsequent conversion into casing for meat products and the like comprising the steps of forming a fibrous paper web, treating the fibers of the paper web with a water soluble polyalkylene imine resin in an amount of about 3.0% by weight and less based on the weight of the fibrous web, treating the fibrous web paper with a diluted viscose solution having a cellulose concentration of about 2% by weight and less and subsequently regenerating the cellulose in the treating viscose by means of an acid, treating said fibers with a polyamide-epihalohydrin resin in an amount of 0.1 to 4% by weight of the fibrous web on a dry weight basis, whereby the casing base paper resulting from these treatments has an alkaline wet tensile strength substantially greater than the sum of the alkaline wet tensile strengths of (1) paper of comparable fiber content treated with only said polyalkylene imine (2) paper of comparable fiber content treated with only said diluted viscose solution and the cellulose regenerated and (3) paper of comparable fiber content treated with said polyamide epihalohydrin resin.

4,222,822

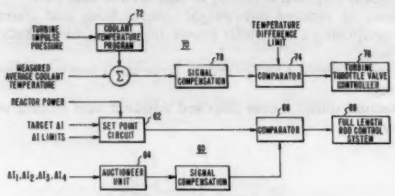
METHOD FOR OPERATING A NUCLEAR REACTOR TO ACCOMMODATE LOAD FOLLOW WHILE MAINTAINING A SUBSTANTIALLY CONSTANT AXIAL POWER DISTRIBUTION

Norman P. Mueller, Level Green; Charles E. Rossi, and Lawrence R. Scherpereel, both of Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1977, Ser. No. 760,490

Int. Cl.[2] **G21C** *7/00*

U.S. Cl. 176—20 R **7 Claims**



1. A method of operating a pressurized water nuclear reactor steam generation system having a reactive core including fissile material with an axial dimension, means for controlling the axial power distribution of the core, a coolant medium and moderator for respectively removing heat from the core and slowing down neutrons in the core for fissioning, the moderator having a negative reactivity temperature coefficient, a primary coolant loop for conveying the coolant medium to a heat exchanger steam generator and a secondary loop for conveying the steam generated to a steam utilization device, including the steps of:

maintaining a substantially symmetric power distribution axially throughout the core during normal reactor power operation including load follow;

operating the steam generator completely below the superheated steam region throughout normal power operation, including load follow; and

increasing the reactivity within the core and the reactor's power output without substantially altering the axial power distribution of the core, upon a given demand, by reducing the average temperature within the core, during normal reactor power operation including load follow, while maintaining a substantially constant primary coolant flow rate.

4,222,823

METHOD FOR PROCESSING CHLORINATED HYDROCARBON RESIDUES

Reinhold Wickbold; Wolfgang H. E. Müller; Hans Regner; Günter Scharein; Franz Langheim; Rolf Ruthemeier; Karl-Hans Simmrock, and Rolf Baumann, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 3, 1976, Ser. No. 720,356

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 2540178

Int. Cl.[2] **B01D** *1/22;* **C01B** *7/08;* **C10B** *57/04*

U.S. Cl. 201—2.5 **11 Claims**

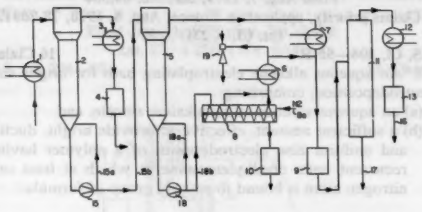
1. In the method for the processing of liquid chlorinated hydrocarbon residues containing solids and forming viscous to solid deposits during the separation of readily boiling components into

(1) distillable organic components,

(2) hydrogen chloride, and

(3) solid matter with a low chlorine content

the improvement comprising gently concentrating said liquid chlorinated hydrocarbon residues in a first process step, removing concentrated residues and decomposing in a second



process step said concentrated residues at temperatures of about 200°–400° C., followed by continuously separating the vapor-phase components from the solid components.

4,222,824

RECUPERATIVE COKE OVEN AND PROCESS FOR THE OPERATION THEREOF

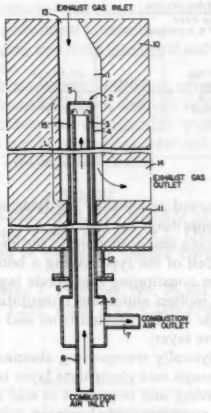
Claus Flockenhaus, Essen, and Edgar Hartkopf, Mülheim, both of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany and Bergwerksverband GmbH, Essen-Kray, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,154

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808213

Int. Cl.[2] C10B *5/20*

U.S. Cl. 201—41 **12 Claims**



1. In a recuperative coke oven of the type including an oven chamber, heating flues, at least one recuperator chamber arranged below said oven chamber and defined by heating walls formed of fire-resistant brickwork, exhaust gas inlet means for introducing hot undergrate firing exhaust gas into said recuperator chamber, and exhaust gas outlet means for discharging exhaust gas from said recuperator chamber, the improvement comprising:

at least one recuperator extending into said recuperator chamber;

said recuperator comprising an inner elongated tubular member and an outer elongated tubular member coaxially surrounding said inner tubular member and defining therebetween an elongated annular chamber;

said inner tubular member having a first end positioned outside of said recuperator chamber for introducing combustion air to be heated into said inner tubular member, such that said combustion air flows through said inner tubular member in a first direction;

said inner tubular member having an open second end positioned within said recuperator chamber for discharging said combustion air from said inner tubular member;

said outer tubular member having a closed first end positioned within said recuperator chamber for closing said annular chamber, such that said combustion air discharged from said open second end of said inner tubular member is caused to flow through said annular chamber in a second direction opposite to said first direction, and said that said combustion air flowing through said annular chamber is heated by exhaust gas passing through said recuperator chamber from said exhaust gas inlet means to said exhaust gas outlet means;

said outer tubular member having a second end positioned outside of said recuperator chamber;

heated combustion air outlet means, connected to said second end of said outer tubular member, for discharging heated combustion air from said annular chamber; and

means for regulating the temperature of the heated combustion air discharged from said heated combustion air outlet means by controlling the amount of heat taken from said exhaust gas passing through said recuperator chamber and said exhaust gas outlet means, said regulating means comprising means for mounting said recuperator to slidably extend through a wall of said recuperator chamber, such that the effective length of said recuperator within said recuperator chamber is adjustable.

4,222,825

PROCESS AND AN INSTALLATION FOR THE TREATMENT OF WATER

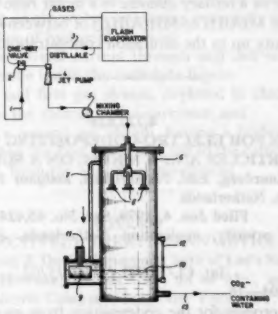
Remilio L. Eisden, Willemstad, Curacao, Netherlands Antilles, assignor to Eilandgebied Curacao, Willemstad, Curacao, Netherlands Antilles

Continuation of Ser. No. 802,950, Jun. 2, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,675

Claims priority, application Netherlands, Jun. 2, 1976, 7605952

Int. Cl.[2] C02B *1/04*

U.S. Cl. 203—11 **5 Claims**



1. A process for the treatment of distillate water, comprising: recovering distillate water by flash evaporation from impure water, such as sea water, recovering gases desorbed during said flash evaporation, including carbon dioxide, and introducing the same into an absorber, introducing said distillate water into said absorber and intermixing said distillate water with said gases so that substantially all of the carbon dioxide in said gases is absorbed by said distillate water, to thereby improve the property of said distillate water for human consumption.

4,222,826
PROCESS FOR OXIDIZING VANADIUM AND/OR URANIUM

Olen L. Riggs, Jr., Bethany, and Dennis A. Brunsell, Oklahoma City, both of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Oct. 10, 1978, Ser. No. 949,885
Int. Cl.² C25C *1/22*
U.S. Cl. 204—1.5 10 Claims

1. An electrolytic oxidation process comprising:
providing an electrolytic cell containing an anode comprising a substrate material selected from the group of titanium, tantalum, zirconium, niobium, hafnium and alloys thereof upon which manganese dioxide has been electrodeposited and a cathode;
providing said electrolytic cell with an electrolyte containing oxidizable specie selected from the group of vanadium and uranium;
providing a reference electrode in ionic contact with the electrolyte; and
electrolyzing the electrolyte within the electrolytic cell by potentiostatic means wherein the electrical potential between the anode and the reference electrode is maintained in a preselected range to oxidize those specie present in the electrolyte capable of oxidation thereby.

4,222,827
ELECTROPLATING SOLUTION FOR THE ELECTRODEPOSITION OF ALUMINIUM

Theo E. G. Daenen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1979, Ser. No. 39,718
Claims priority, application Netherlands, May 22, 1978, 7805490
Int. Cl.² C25D *3/44*
U.S. Cl. 204—14 N 4 Claims

1. An electroplating solution for electro-depositing ductile aluminum on at least superficially electrically conducting substrates, said solution comprising $MIAlH_4$ or $MII(AlH_4)_2$, in a quantity up to the saturation concentration in an anhydrous aprotic solvent, where MI is an alkali metal or quaternary ammonium and M II is an alkaline earth metal, and aluminum-hydride, coordinatively bound to a tertiary amine, an aryl-phosphine or a tertiary diamine in a molar ratio relative to the compound $MIAlH_4$ or $MII(AlH_4)_2$ of between 4 and 0.25 and in a quantity up to the saturation concentration.

4,222,828
PROCESS FOR ELECTRO-CODEPOSITING INORGANIC PARTICLES AND A METAL ON A SURFACE

Eduard Zuurdeeg, Ede, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 4, 1979, Ser. No. 45,424
Claims priority, application Netherlands, Jun. 6, 1978, 7806188
Int. Cl.² C25D *15/00, 15/02*
U.S. Cl. 204—16 9 Claims

1. In a process for the codeposition from an electroplating bath of a metal and solid inorganic particles on an article acting as a cathode, which particles are kept suspended in the bath liquid in the presence of a surfactant and have an average size of less than 300 μm and are used in a concentration of 10 to 150 grams per liter of bath liquid, characterized in that the surfactant is a cationic fluorocarbon compound in at least the same weight ratio to the particles in the bath liquid as in an 0.005 N KNO_3-solution in which the particles assume a zeta-potential of at least +40 mV with the exclusive use of said cationic fluorocarbon compound.

4,222,829
ALKALINE ZINC ELECTROPLATING BATH AND PROCESS

Francine Popescu, 27, Rue du Centre, 94490 Ormesson, France

Filed Aug. 7, 1979, Ser. No. 64,504
Claims priority, application France, Aug. 8, 1978, 78 23312
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R 16 Claims

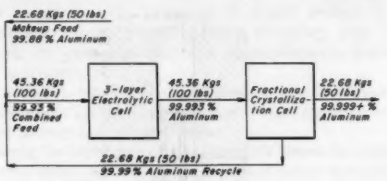
1. An aqueous alkaline electroplating bath for bright zinc electrodeposition, comprising:
(a) an aqueous solution of an alkaline zincate, and
(b) a sufficient amount, effective to provide bright, ductile and uniform zinc electrodeposits, of a polymer having recurrent units of alkyleneamine in which at least one nitrogen atom is bound to an acyl group of formula:

wherein R′ represents an alkyl, alkenyl, phenyl, alkylphenyl, naphthyl, pyridyl, furyl or thienyl radical, which radical may be unsubstituted or substituted with one or several substituents selected from: hydroxy, alkyl, carboxy, sulfoxy or halogen.

4,222,830
PRODUCTION OF EXTREME PURITY ALUMINUM

Robert K. Dawless, Monroeville, and Stanley C. Jacobs, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 973,141
Int. Cl.² C25C *3/06*
U.S. Cl. 204—67 19 Claims



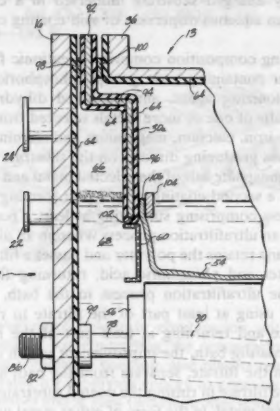
1. An improved process for purifying aluminum containing impurities comprising:
(a) introducing said aluminum to the anode layer of an electrolytic cell of the type having a bottom layer of molten aluminum constituting said anode layer and having a top layer of molten aluminum constituting a cathode layer, said anode layer separated from said cathode layer by an electrolyte layer;
(b) electrolytically transporting aluminum from said anode layer through said electrolyte layer to said cathode layer while leaving said impurities in said anode layer thereby partially purifying said aluminum, said transporting being capable of recovering aluminum at the cathode consisting essentially of 99.993 wt.% aluminum;
(c) thereafter, removing a portion of said partially purified molten aluminum from said cathode layer;
(d) fractionally crystallizing said molten aluminum portion in a crystallization cell to remove eutectic impurities therefrom by solidifying a fraction of said molten aluminum, said solid fraction having a higher purity than that constituting the remaining molten aluminum fraction, thereby concentrating said eutectic impurities in said molten fraction, said crystallizing adapted to recover aluminum product consisting essentially of 99.999 wt.% aluminum when the feed to the process is about 99.993 wt.%; and
(e) separating said molten fraction from said solid fraction to provide said purified aluminum, said improved process suited to recover 50 wt.% of the feed to the process.

4,222,831

INTERNAL GAS SEPARATION ASSEMBLY FOR HIGH CURRENT DENSITY ELECTROLYTIC CELLS

Steven J. Specht, Mentor, Ohio, and Kenneth E. Woodard, Jr., Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 11, 1979, Ser. No. 2,483
Int. Cl.³ C25B *1/34, 9/00*
U.S. Cl. 204—98 **11 Claims**



1. In the process of electrolyzing a brine in an electrolytic cell, having at least one anode, at a total cell current above 2500 amperes per square foot of internal cell horizontal area whereby a froth of chlorine and electrolyte would otherwise be generated, the improvement comprising:

(a) partially separating said froth into liquid and gas fractions within said anode; and

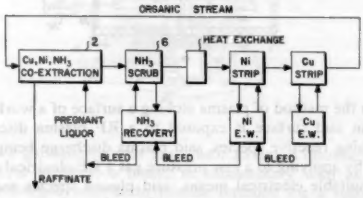
(b) completing the substantial separation of said froth into liquid and gas fractions within said cell in a disengaging zone having a horizontal cross-section area of less than 0.13 square feet per kiloampere of total cell current.

4,222,832

CASCADING ELECTROLYTE BLEED STREAMS

Gale L. Hubred, Irvine, Calif., and Edwin L. Owen, San Antonio, Tex., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed May 7, 1979, Ser. No. 36,332
Int. Cl.² C25C *1/08, 1/12*; C22B *3/00*
U.S. Cl. 204—106 **8 Claims**



1. A process for recovering copper and nickel from a copper and nickel rich aqueous leach liquor containing dissolved metallic impurities, said process comprising the steps of

feeding the liquor to an extraction stage wherein the copper and nickel values are extracted with an organic extractant which preferentially but not exclusively takes up copper and nickel from the liquor,

in a nickel recovery circuit, selectively stripping nickel from the extractant at a temperature between the range of 40°–55° C. with a first acid solution, electrowinning nickel from the acid solution, and recirculating the nickel-depleted acid solution to strip more nickel,

in a copper recovery circuit, stripping copper metal values from the extractant with a second acid solution, electrowinning copper from the second acid solution, and recirculating the copper-depleted second acid solution to strip more copper metal values,

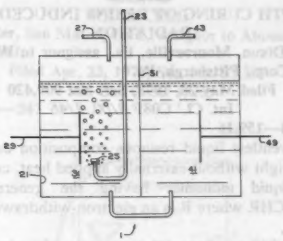
preventing the build-up of impurities in the copper electrowinning circuit and preventing the build-up of impurities in the nickel electrowinning circuits by taking a bleed stream from both said circuits and feeding the bleed stream solutions to a stage prior to the metal stripping stages so that the build-up of impurities in the system beyond a predetermined level is prevented.

4,222,833

SNIFF GAS RECOVERY METHOD

Gordon A. Carlson, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 10, 1979, Ser. No. 73,829
Int. Cl.³ C25B *1/26*
U.S. Cl. 204—128 **11 Claims**



1. A method of treating a chlorine containing first gas stream in an electrolytic cell having an aqueous hydrochloric acid catholyte liquor containing catholyte compartment, an aqueous hydrochloric acid anolyte liquor containing anolyte compartment and an ion permeable barrier therebetween, which method comprises:

feeding said first gas stream to the catholyte compartment containing an electrolyte consisting essentially of an aqueous solution of hydrochloric acid;

passing an electrical current through said cell whereby to form chloride ion in the catholyte liquor;

recovering said first gas stream, depleted in chlorine content, from the catholyte compartment; and

recovering a second gas stream, having a higher chlorine content than the first gas stream fed to the catholyte compartment, from the anolyte compartment.

4,222,834

SELECTIVELY TREATING AN ARTICLE

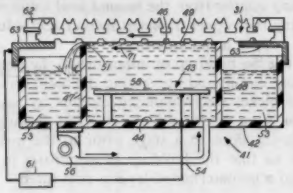
Duane E. Bacon; J. David Gattermeir, both of Lee's Summit, and Bonnie J. Hrivnak, Kansas City, all of Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 6, 1979, Ser. No. 45,895
Int. Cl.³ C25F *3/16, 7/00*
U.S. Cl. 204—129.6 **9 Claims**

1. A method of selectively treating an article to smooth an edge surface of such article in an electrolytic bath wherein surfaces of such article upon being exposed to a wetting treating fluid are acted upon by such fluid, the method comprising:

contacting an edge surface of the article to the surface of the wetting treating fluid such that the surface tension of the fluid causes a meniscus to form along surfaces adjacent to the edge surface;

vertically positioning the edge surface with respect to the surface of the treating fluid to maintain the edge surface substantially at the surface of the bath and to expose the side surfaces of the article to substantially none of the treating fluid other than that contained in the meniscus,



thereby limiting the action of the treating fluid on such side surfaces; and

removing the edge surface of the article from contact with the bath of the treating fluid after a time period sufficient to conclude the smoothing treatment by the fluid on the exposed edge surface of the article.

4,222,835

IN DEPTH CURING OF RESINS INDUCED BY UV RADIATION

George D. Dixon, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 25, 1978, Ser. No. 909,420
Int. Cl.[3] C08F 8/00, 2/46
U.S. Cl. 204—159.16 **23 Claims**

1. A solventless liquid resinous composition curable with ultraviolet light without externally applied heat, comprising:

(1) a liquid monomer having the general formula CH_2=CHR where R is an electron-withdrawing organic group;

(2) about 0.01 to about 4% by weight of a photo-initiator capable of initiating the polymerization of said monomer when exposed to ultraviolet light;

(3) about 0.01 to about 4% by weight of a thermal-initiator capable of initiating the polymerization of said monomer when activated by the exothermic heat of polymerization, said thermal-initiator being a different compound than said photo-initiator; and

(4) about 0.01 to about 0.5% by weight of an accelerator capable of lowering the temperature at which said thermal-initiator is activated by heat.

4,222,836

ACIDIC AGAR GEL ELECTROCHROMATOGRAPHY OF GLYCOHEMOGLOBINS

Robert J. Kerr, Painted Post, and Milos Stastny, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,472
Int. Cl.[2] G01N 33/16, 27/26
U.S. Cl. 204—180 G **18 Claims**

1. In a method for discretely separating glycohemoglobins from nonglycosylated hemoglobins by citrate agar gel electrochromatography in which the gel buffer has a citrate concentration of 0.05 M and a pH of 6.2, the improvement which comprises employing:

A. an agar gel having a wet thickness of from about 0.1 to about 0.5 mm.,

B. a citrate gel buffer having a citrate concentration of from about 0.02 to about 0.05 M and a pH of from about 5.8 to about 6.8,

C. a citrate well buffer having a citrate concentration of from about 0.05 to about 0.1 M and a pH of from about 6.0 to about 6.5, and

D. a field strength of from about 5 to about 20 volts per cm.

4,222,837

ELECTRODEPOSITION PROCESS WITH ULTRAFILTRATION

Isidor Hazan, Clementon, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 10, 1979, Ser. No. 56,216
Int. Cl.[2] C25D 13/06, 13/10, 13/20
U.S. Cl. 204—181 C **6 Claims**

1. In a process for electrocoating with a coating composition a negatively charged substrate immersed in a coating bath containing an aqueous dispersion of said coating composition, wherein

said coating composition comprises a cationic film-forming polymer containing basic groups, phosphoric acid as an acidic ionizing agent, and dissolved dihydrogen phosphate salts of one or more metals selected from the group of zinc, iron, calcium, magnesium and aluminum,

said process producing directly on the substrate a first coating of phosphate salt of the selected metal and on said first coating a second coating of said film-forming polymer,

said process comprising subjecting at least a portion of the bath to an ultrafiltration process wherein an ultrafiltration membrane retains the polymer and passes a filtrate including water and phosphoric acid, returning the retentate from the ultrafiltration process to the bath, and subsequently using at least part of the filtrate to rinse coated substrate and returning at least part of the rinse to the electrocoating bath, the improvement which comprises

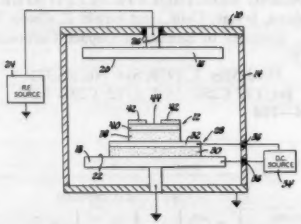
immersing in the filtrate, separate from the bath and prior to the use of the filtrate in rinsing the coated substrate, a quantity of said selected metal, in the form of either metal or oxide, and permitting reaction of said metal with phosphoric acid to produce dissolved dihydrogen metal phosphate salts in the filtrate.

4,222,838

METHOD FOR CONTROLLING PLASMA ETCHING RATES

Jayant K. Bhagat, Troy, and Martin C. Steele, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 13, 1978, Ser. No. 915,149
Int. Cl.[2] C23F 1/00
U.S. Cl. 204—192 E **5 Claims**



1. In the method of plasma etching a surface of a workpiece wherein said surface is exposed to a RF plasma discharge containing reactive species, said plasma discharge being produced by applying to a low pressure gas a RF electrical signal using suitable electrical means, said plasma species reacting with said surface to convert portions thereof to a gaseous product to thereby etch said surface, the improvement comprising

contacting the workpiece with an electrical conductor so as not to interfere with the contact of the exposed surface by the plasma,

electrically insulating the conductor and the workpiece from the plasma-producing electrical means, and

applying a time-constant electrical potential independent of

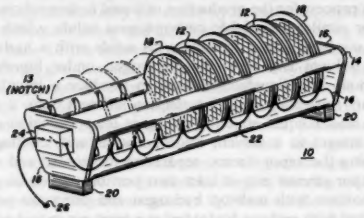
the RF signal to said conductor to control the rate at which the surface is etched.

4,222,839

WORKPIECE HOLDER AND METHOD FOR PLASMA REACTOR APPARATUS

Willis R. Goodner, Chandler, Ariz., and Joseph P. Y. Kao, Berkeley, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 21, 1978, Ser. No. 944,427
Int. Cl.[2] C23F 1/00; B01K 1/00
U.S. Cl. 204—192 E **9 Claims**



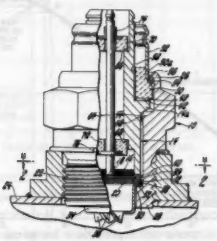
1. In a workpiece holder in combination with a plasma reactor apparatus for controlling the temperature of workpieces during a chemical reaction, said plasma reactor having an RF generator for supplying energy to generate a plasma, a reaction chamber and at least two electrodes within said chamber, the improvement in said workpiece holder comprising: a metallic member in proximity to which the workpiece can be placed, and temperature actuated connecting means, one of said member being selectively connected electrically to said electrodes of said plasma reactor apparatus by said temperature actuated means.

4,222,840

HEATED SOLID ELECTROLYTE OXYGEN SENSOR

Michael P. Murphy, Flint, and George W. Hillebrand, Davison, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,643
Int. Cl.[2] G01N 27/58
U.S. Cl. 204—195 S **1 Claim**



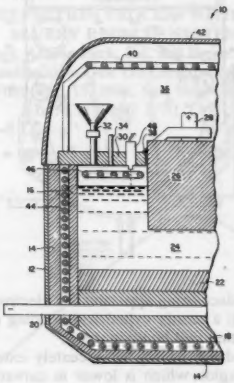
1. In a galvanic exhaust gas sensor having a circular solid electrolyte member, a heater in subassembly with an outwardly flanged concentric tubular terminal for a reference electrode on said electrolyte member, an inwardly flanged concentric tubular metal shell surrounding said member and said heater-terminal subassembly, and means coacting with said terminal and shell flanges for holding said member, heater-terminal subassembly and shell together in a fixed predetermined concentric relationship, the improvement wherein said solid electrolyte member is a substantially flat circular disc having a reference electrode on one face, said heater includes a spiral resistance heating element having a substantially flat heating face, and said subassembly includes an elongated heating element terminal coaxially extending through said tubular electrode terminal, and electrical insulating means for supporting said heating element terminal on said electrode terminal in a fixed placement along the longitudial axis of said electrode terminal, each of said terminals having one end adjacent one end on the other terminal, said adjacent ends on said terminals respectively affixed to opposite ends of said heating element spiral with said flat heating face normal to said longitudinal axis, whereby coaxial assembly of said electrolyte disc, heater-terminal subassembly, and shell inherently aligns said disc and element faces and generally parallelly spaces them a fixed predetermined distance apart.

4,222,841

HALL CELL

John J. Miller, San Mateo, Calif., assignor to Alumax Inc., San Mateo, Calif.

Filed Apr. 23, 1979, Ser. No. 32,357
Int. Cl.[2] C25C 3/22
U.S. Cl. 204—247 **7 Claims**



1. Improved apparatus for the production of aluminum, the apparatus being of the reduction cell type having a molten electrolyte bath containing dissolved alumina, an open mouthed container for the electrolyte bath, an anode and a cathode immersed in the bath, and means for applying an electric current between the anode and the cathode whereby aluminum is produced and resistance heat is generated, and wherein the improvement comprises

thermal insulation surrounding the walls of the container,

a refractory cover over the open mouth of the container,

a heat exchanger positioned above the molten bath, within the container and beneath the cover for recovering heat from the molten bath,

and means, including a temperature sensor for monitoring the electrolyte bath temperature, for selectively controlling the rate of heat recovery by the heat exchanger to maintain the electrolyte bath within a predetermined temperature range, irrespective of limited variations in the supply of electric current to the cell.

4,222,842
ELECTRODE FOR ELECTROLYSIS

Pierre Bouy, Enghien les Bains, and Dominique Ravier, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

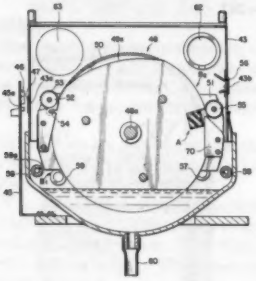
Filed Mar. 7, 1979, Ser. No. 18,150
Claims priority, application France, Mar. 13, 1978, 78 07093
Int. Cl.[2] C25B *11/10*; B32B *15/04*; C25B *1/34*
U.S. Cl. 204—290 F **11 Claims**

1. An electrode for electrolysis of sodium chloride, having absent any precious metal, comprising a valve-metal substrate and a coating containing a cobalt oxide, said cobalt oxide corresponding to the formula $Co_{3-x}O_4$, in which x is between about 0.1 and 0.01, said coating comprises cobalt oxide and a compound of titanium with an element selected from the group consisting of hydrogen and oxygen, the valence of the titanium in said compound being less than 3.

4,222,843
COLORING-DECOLORING APPARATUS FOR ELECTROPHORETIC SYSTEMS

Hideo Suzuki, Tokyo; Toshihide Fujiwara, Fuchu, and Nobutaka Kaneko, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,170
Claims priority, application Japan, Apr. 27, 1978, 53-55254[U]; Apr. 27, 1978, 53-55255[U]
Int. Cl.[2] C25D *1/12*
U.S. Cl. 204—299 R **4 Claims**



1. A coloring-decoloring apparatus for electrophoretic systems, comprising: a mostly cylindrical bonding drum; means rotatably supporting said bonding drum;

said bonding drum having an arcuately extending outer peripheral region which is lower in curvature than the imaginary circular circumference of the remainder of the outer periphery of said drum;

a support plate which is arranged close to the outer periphery of said bonding drum;

two rollers mounted on said support plate and arranged to contact with said remainder of the outer periphery of said bonding drum and at a definite interval reserved therebetween which is greater than said lower in curvature region of said drum; a liquid trough which is so arranged as to dip a portion of said bonding drum with liquid;

means for filling said liquid trough with coloring liquid agent;

means for filling the same said liquid trough with decoloring agent;

said coloring-decoloring apparatus including means for bonding a sample carrier onto the outer periphery of said bonding drum while rotating said drum so as to overlay said peripheral region which is lower in curvature;

means for holding said sample carrier with said two rollers;

means for rotating said bonding drum and support plate as a unit to color said sample carrier when a coloring liquid agent is filled in said liquid trough and then to decolor said sample carrier by replacing said coloring liquid agent with a decoloring liquid agent in said liquid trough.

4,222,844
USE OF ONCE-THROUGH TREAT GAS TO REMOVE THE HEAT OF REACTION IN SOLVENT HYDROGENATION PROCESSES

Alan J. Nizamoff, Convent Station, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 8, 1978, Ser. No. 904,096
Int. Cl.[2] C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **4 Claims**

1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and molecular hydrogen under liquefaction conditions in a liquefaction zone to produce a liquefaction effluent; separating said liquefaction effluent into a vapor stream and a liquid stream; passing at least a portion of the liquid stream to a solvent hydrogenation unit; cooling and scrubbing the vapor stream; separating the cooled and scrubbed vapor stream into at least two portions; combining one such portion with makeup hydrogen and using the portion combined with makeup hydrogen as a treat gas in said solvent hydrogenation unit to effect hydrogenation of liquid in said solvent hydrogenation unit; using another portion of said vapor stream to effect quenching of the hydrogenation reaction; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction and recycling said vaporous fraction inluding molecular hydrogen and at least a portion of said liquids fraction to said liquefaction zone.

4,222,845
INTEGRATED COAL LIQUEFACTION-GASIFICATION-NAPHTHA REFORMING PROCESS

Bruce K. Schmid, Denver, Colo., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,279
Int. Cl.[2] C10G *1/00, 1/08*; C10J *1/00, 3/00*
U.S. Cl. 208—8 LE **5 Claims**

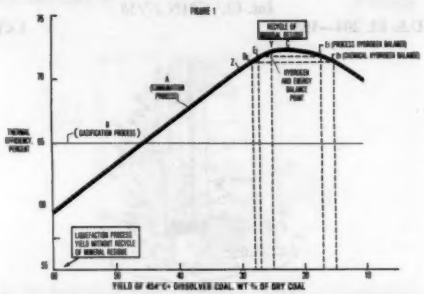


FIGURE 1
RECYCLE OF MINERAL RESIDUE
HYDROGEN AND ENERGY BALANCE PLANT
A (COMBUSTION PROCESS)
B (GASIFICATION PROCESS)
LIQUEFACTION PROCESS YIELDS WITHOUT RECYCLE OF MINERAL RESIDUE
THERMAL EFFICIENCY, PERCENT
YIELD OF 450°F+ DISSOLVED COAL, WT % OF DRY COAL

1. A combination coal liquefaction-gasification-naphtha reforming process comprising passing substantially the entire raw mineral-containing feed coal for the process, hydrogen, recycle dissolved liquid solvent, recycle normally solid dissolved coal and recycle mineral residue to a coal liquefaction zone to dissolve hydrocarbonaceous material from mineral residue and to hydrocrack and hydrocarbonaceous material to produce a mixture comprising hydrocarbon gases, naphtha, dissolved liquid boiling above the naphtha boiling range, normally solid dissolved coal and suspended mineral residue; recycling to said liquefaction zone a portion of said dissolved liquid boiling above the naphtha boiling range, normally solid dissolved coal and mineral residue; separating a naphtha frac-

tion; separating distillate liquid boiling above the naphtha range from non-recycled normally solid dissolved coal and mineral residue to produce a gasifier feed slurry; passing substantially the entire naphtha yield of said liquefaction zone through a reforming zone including heating means, a hydropretreater and a reformer for conversion to gasoline; said reforming zone producing a first hydrogen-rich stream; returning said first hydrogen-rich stream to said process for use as process hydrogen; said gasifier feed slurry comprising substantially the entire normally solid dissolved coal and mineral residue yield of said liquefaction zone substantially without normally liquid coal and hydrocarbon gases; passing said gasifier feed slurry to a gasification zone; said gasifier feed slurry comprising substantially the entire hydrocarbonaceous feed to said gasification zone; said gasification zone including an oxidation zone for the conversion of hydrocarbonaceous material to synthesis gas; converting a portion of said synthesis gas to a second hydrogen-rich stream and returning said second hydrogen-rich stream to said process for use as process hydrogen; the amount of hydrocarbonaceous material passed to said gasification zone being sufficient to enable said gasification zone to produce an additional amount of synthesis gas beyond the amount required for process hydrogen; burning said additional amount of synthesis gas or a CO fraction thereof without hydrogenative upgrading as fuel in said process; said additional amount of synthesis gas or a CO fraction thereof being sufficiently great that the efficiency of said coal liquefaction-gasification-reforming process is no more than two percentage points lower than the efficiency of the same process without the reforming step.

4,222,846

COAL LIQUEFACTION-GASIFICATION PROCESS INCLUDING REFORMING OF NAPHTHA PRODUCT

Bruce K. Schmid, Denver, Colo., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1978, Ser. No. 969,280

Int. Cl.[2] C10G *1/00, 1/08;* **C10J** *1/00, 3/00*

U.S. Cl. 208—8 LE **12 Claims**

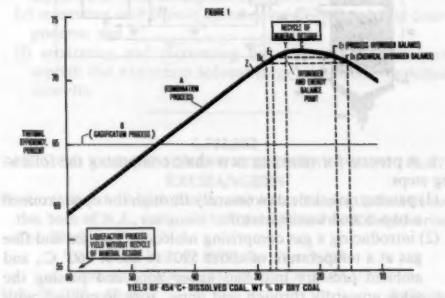


FIGURE 1
RECYCLE OF MINERAL RESIDUE
A COMBINATION PROCESS
B (GASIFICATION PROCESS)
LIQUEFACTION PROCESS YIELD WITHOUT RECYCLE OF MINERAL RESIDUE
YIELD OF 454°C- DISSOLVED COAL, WT % OF DRY COAL

1. A combination coal liquefaction-gasification-naphtha reforming process comprising passing substantially the entire raw mineral-containing feed coal for the process, hydrogen, recycle dissolved liquid solvent, recycle normally solid dissolved coal and recycle mineral residue to a coal liquefaction zone to dissolve hydrocarbonaceous material from mineral residue and to hydrocrack said hydrocarbonaceous material to produce a mixture comprising hydrocarbon gases, naphtha, dissolved liquid boiling above the naphtha boiling range, normally solid dissolved coal and suspended mineral residue; recycling to said liquefaction zone a portion of said dissolved liquid boiling above the naphtha boiling range, normally solid dissolved coal and mineral residue; separating a naphtha fraction; separating distillate liquid boiling above the naphtha range from non-recycled normally solid dissolved coal and mineral residue to produce a gasifier feed slurry; passing a first portion of the total naphtha yield of said process comprising between about 30 and 95 weight percent of the total through a reforming zone comprising heating means, a naphtha hydropretreater and a reformer for conversion to gasoline; said reforming zone producing a first hydrogen-rich stream; returning said first hydrogen-rich stream to said process for use as process hydrogen; passing a second portion of the total naphtha yield comprising between about 5 to 70 weight percent of the total of said process as fuel and burning said second portion of naphtha in said process; said gasifier feed slurry comprising substantially the entire normally solid dissolved coal and mineral residue yield of said liquefaction zone substantially without normally liquid coal and hydrocarbon gases; passing said gasifier feed slurry to a gasification zone; said gasifier feed slurry comprising substantially the entire hydrocarbonaceous feed to said gasification zone; said gasification zone including an oxidation zone for the conversion of hydrocarbonaceous material to synthesis gas; converting a portion of said synthesis gas to a second hydrogen-rich stream; returning said second hydrogen-rich stream to said process for use as process hydrogen; the amount of hydrocarbonaceous material passed to said gasification zone being sufficient to enable said gasification zone to produce an additional amount of synthesis gas beyond the amount required to produce process hydrogen; burning said additional amount of synthesis gas or a CO fraction thereof without hydrogenative upgrading as fuel in said process; and the amount of hydrocarbonaceous material passed to said gasification zone being established so that the thermal efficiency of said process is substantially unaffected by changes in the ratio of said first portion of naphtha to said second portion of naphtha.

4,222,847

COAL LIQUEFACTION PROCESS WITH IMPROVED SLURRY RECYCLE SYSTEM

Norman L. Carr, Allison Park, Pa., and Bruce K. Schmid, Denver, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 969,802

Int. Cl.[2] C10G *1/00, 1/08*

U.S. Cl. 208—8 LE **10 Claims**

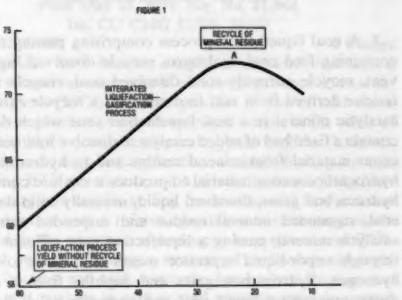


FIGURE 1
RECYCLE OF MINERAL RESIDUE
A
INTEGRATED LIQUEFACTION—GASIFICATION PROCESS
LIQUEFACTION PROCESS YIELD WITHOUT RECYCLE OF MINERAL RESIDUE
YIELD OF 454°C+ DISSOLVED COAL, WT % OF DRY COAL

1. A coal liquefaction process comprising passing mineral-containing feed coal, hydrogen, recycle dissolved liquid solvent, recycle normally solid dissolved coal and recycle mineral residue to a coal liquefaction zone which does not contain a fixed bed of added catalyst to dissolve hydrocarbonaceous material and to produce a mixture comprising hydrocarbon gases, dissolved liquid, normally solid dissolved coal and suspended mineral residue; passing a liquefaction zone effluent stream through vapor-liquid separator means to remove overhead hydrogen, hydrocarbon gases and naphtha from a residue slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; recycling to said liquefaction zone a first portion of said residue slurry; passing a second portion of said residue slurry to product separation means; passing a third portion of said residue slurry through hydroclone means; recovering from said hydroclone means an over-

head slurry comprising liquid coal and normally solid dissolved coal containing particles of suspended mineral residue having a smaller median diameter as compared to the particles in said first portion of residue slurry; recycling said overflow slurry to said liquefaction zone to reduce the median diameter of the suspended particles recycled to said liquefaction zone; recovering from said hydroclone means an underflow slurry comprising liquid coal and normally solid dissolved coal with particles of suspended mineral residue having a larger median diameter as compared to the particles in said first portion of residue slurry; and passing said underflow slurry to said product separation means.

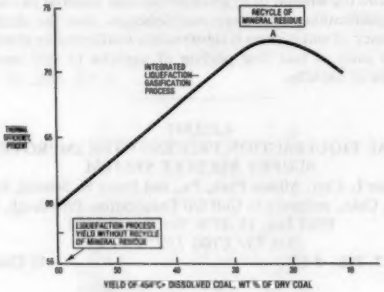
4,222,848

COAL LIQUEFACTION PROCESS EMPLOYING EXTRANEOUS MINERALS

Norman L. Carr, Allison Park, Pa., and Bruce K. Schmid, Denver, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 969,803
Int. Cl.[2] C10G *1/00, 1/08*
U.S. Cl. 208—8 LE **14 Claims**

FIGURE 1


RECYCLE OF MINERAL RESIDUE
A
INTEGRATED LIQUEFACTION-GASIFICATION PROCESS
LIQUEFACTION PROCESS YIELD WITHOUT RECYCLE OF MINERAL RESIDUE
YIELD OF 454°C+ DISSOLVED COAL, WT % OF DRY COAL

1. A coal liquefaction process comprising passing mineral-containing feed coal, hydrogen, recycle dissolved liquid solvent, recycle normally solid dissolved coal, recycle mineral residue derived from said feed coal and a recycle extraneous catalytic mineral to a coal liquefaction zone which does not contain a fixed bed of added catalyst to dissolve hydrocarbonaceous material from mineral residue and to hydrocrack said hydrocarbonaceous material to produce a mixture comprising hydrocarbon gases, dissolved liquid, normally solid dissolved coal, suspended mineral residue and suspended extraneous catalytic mineral; passing a liquefaction zone effluent stream through vapor-liquid separator means to remove overhead hydrogen, hydrocarbon gases and naphtha from a residue slurry comprising liquid coal and normally solid dissolved coal, suspended mineral residue and suspended particles of extraneous catalytic mineral; recycling a first portion of said residue slurry to said liquefaction zone; passing a second portion of said residue slurry to a product separation means; passing a third portion of said residue slurry through hydroclone means; recovering from said hydroclone means an overflow slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue and a higher than aliquot weight proportion of suspended particles of extraneous catalytic mineral; recycling said overflow slurry to said liquefaction zone to reduce the median diameter of particles recycled to said liquefaction zone and to selectively increase the proportion of said extraneous catalytic mineral in said liquefaction zone; recovering from said hydroclone means a concentrated solids underflow slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; and passing said underflow slurry to said product separation means.

4,222,849

PROCESS OF LIQUEFACTION OF COAL

Kunitoshi Shimizu, No. 600, Kowata, Chigasaki-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 881,721, Feb. 27, 1978, abandoned. This application Jul. 5, 1979, Ser. No. 54,677
Int. Cl.[3] C10G *1/00;* B01J *37/00*
U.S. Cl. 208—8 LE **8 Claims**

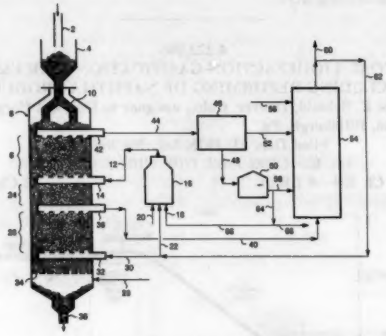
1. A process of liquefaction of coal, to form an oily product comprising, impregnating a granulated coal with aqueous solution of caustic soda by soaking it in said solution, pulverizing the so treated coal, after it is taken out and dried, to a particle size smaller than 100-mesh, mixing the so obtained coal powder with an aqueous solution containing sodium hydroxide and organic carboxylic acid, keeping the mixture still for a sufficient time until the coal shows a first sign of liquefaction by the initial appearance of an oily product on the surface of the mixture and, finally, heating the mixture at a temperature from 90° to 120° C. with a further addition of water thereto.

4,222,850

PROCESS FOR RETORTING OIL SHALE

Charles W. Matthews, Lakewood, Colo., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 15, 1979, Ser. No. 12,500
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **30 Claims**



1. A process for retorting new shale comprising the following steps:

(1) passing raw shale downwardly through the upper zone of a two-zoned vertical retort;

(2) introducing a gas comprising molecular oxygen and flue gas at a temperature of about 590° to about 760° C., and ambient pressure into said upper zone and passing the same upwardly through said upper zone in contact with said raw shale;

(3) recovering from an upper part of said upper zone a product comprising shale oil and retort gas;

(4) passing said retort gas to a furnace;

(5) passing the treated shale from a lower part of said upper zone downwardly through the lower zone of said two-zoned retort;

(6) introducing molecular oxygen at a temperature of about 25° to about 100° C. and flue gas at a temperature of about 25° to about 200° C., and ambient pressure into said lower zone and passing the same upwardly through said lower zone in contact with said treated shale;

(7) recovering from an upper part of said lower zone a preheated gas comprising molecular oxygen and preheated flue gas;

(8) introducing said preheated gas comprising molecular oxygen and preheated flue gas recovered from an upper part of said lower zone into a furnace; and

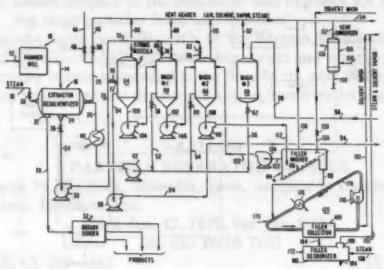
(9) recovering from a lower part of said lower zone spent shale.

4,222,851

RECOVERY OF ASPHALT SHINGLE COMPONENTS BY SOLVENT EXTRACTION

Robert D. Good, deceased, late of Pittsburgh, Pa. (by Mary E. Good, executrix), and Paul P. Quenin, Pittsburgh, Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1978, Ser. No. 958,172
Int. Cl.[2] C10C *1/00*
U.S. Cl. 208—45 14 Claims



1. A process for treating a solid waste material obtained in a process for manufacturing asphalt shingles and comprised of asphalt and solid components including filler and granules to recover asphalt and said components which comprise:

(a) shredding said solid waste material

(b) introducing said solid waste material into a contact zone;

(c) introducing extraction solvent streams of successively increasing solvent concentrations into said contact zone;

(d) intimately contacting said solid waste material with said extraction solvent for a time sufficient to dissolve said asphalt and form an asphalt-enriched miscella;

(e) separating said asphalt-enriched miscella from solid components; and

(f) separating and recovering by evaporation techniques asphalt and extraction solvent from said asphalt-enriched miscella.

4,222,852

METHOD FOR REMOVING CORONENE FROM HEAT EXCHANGERS

Walter S. Kmak, Scotch Plains, and Akira Yatabe, Lake Hiawatha, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1979, Ser. No. 9,229
Int. Cl.[2] C10G *9/16, 39/00;* C07C *15/12*
U.S. Cl. 208—48 R 4 Claims

1. A method for removing a coronene deposit in a reforming process, while said process is in operation, which comprises the steps of:

(a) contacting a hydrocarbonaceous feedstock having an atmospheric pressure boiling point ranging from about 150° to about 375° F. with a catalyst in the presence of added hydrogen at reforming conditions in a reforming zone;

(b) passing the resulting total reforming zone effluent into a heat exchange zone, said reforming zone effluent comprising at least about 0.5 wppm coronene, at least a portion of which deposits in said heat exchange zone;

(c) separating the heat exchanged total reforming zone effluent into a hydrogen-rich gaseous phase and a liquid hydrocarbon phase comprising normally liquid hydrocarbons and normally gaseous hydrocarbons, the improvement which comprises recycling a portion of said normally liquid hydrocarbons to said heat exchange zone for a time sufficient to remove at least a portion of said coronene deposit from said heat exchange zone.

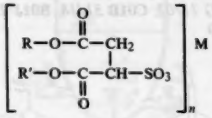
4,222,853

APPLICATION OF SULFOSUCCINIC ESTER ANTI-FOULING AGENTS

Claude Scherrer; Marc Durrieu, both of Le Havre, France, and John R. Richmond, High Beach, England, assignors to Compagnie Francaise de Raffinage and Universal Matthey Products France, both of Paris, France

Filed Mar. 28, 1979, Ser. No. 25,450
Claims priority, application France, Apr. 4, 1978, 78 09855
Int. Cl.[2] C10G *9/16;* C09K *15/12;* C23F *14/02*
U.S. Cl. 208—48 AA 5 Claims

1. A method of decreasing the fouling of equipment in contact with crude petroleum comprising the step of adding to the crude petroleum an anti-fouling amount of at least one compound having the formula:



where R and R′ are linear or branched alkyl groups having between 4 and 12 carbon atoms, M is an atom of a metal from Group IA or IIA of the Periodic Table of elements,

n=1, when M is a metal of Group IA and

n=2, when M is a metal of Group IIA.

4,222,854

CATALYTIC REFORMING OF NAPHTHA FRACTIONS

Frederick H. Vorhis, Jr., Mill Valley, and Keith C. Bishop, III, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 23, 1979, Ser. No. 41,964
Int. Cl.[2] C10G *35/06, 39/00*
U.S. Cl. 208—80 8 Claims

1. A process for reforming a naphtha feedstock in at least a first and second reaction zone in parallel to produce a benzene-toluene-xylene (BTX) enriched product in one of said zones and a motor gasoline of a predetermined octane in the other of said zones which comprises separating said naphtha feedstock into a relatively high-boiling fraction, a middle-boiling fraction containing BTX precursors and a relatively low-boiling fraction, passing said middle-boiling fraction to said first reaction zone in contact with a reforming catalyst at reforming conditions and in the presence of hydrogen to produce said BTX-enriched product, forming a mixture of said relatively high-boiling fraction and said relatively low-boiling fraction and passing said mixture to said second reaction zone in contact with a reforming catalyst at reforming conditions and in the presence of hydrogen to produce said motor gasoline.

4,222,855

PRODUCTION OF HIGH VISCOSITY INDEX LUBRICATING OIL STOCK

Bruce P. Pelrine, Trenton, and Nai Y. Chen, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,855
Int. Cl.[3] C10G *11/05, 47/16*
U.S. Cl. 208—111 12 Claims

1. A process for catalytically dewaxing a waxy hydrocarbon fraction boiling within the approximate range of 450° to 1050° F. to provide a lubricating oil of high viscosity index which comprises contacting said fraction at a temperature between about 500° and about 850° F., a pressure between about 100 and about 3000 psig at a liquid hourly space velocity between about

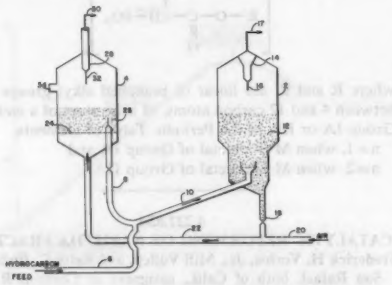
0.1 and about 10 with a catalyst comprising a crystalline aluminosilicate zeolite possessing particularly characterized pore openings defined by (1) a ratio of sorption of n-hexane to o-xylene, on a volume percent basis, of greater than 3, which sorption is determined at a P/P_o of 0.1 and at a temperature of 50° C. for n-hexane and 80° C. for o-xylene and (2) by the ability of selectively cracking 3-methylpentane in preference to 2,3-dimethylbutane at 1000° F. and 1 atmosphere pressure from a 1/1/1 weight ratio mixture of n-hexane/3-methylpentane/2,3-dimethylbutane mixture with the ratio of rate constants k_{3MP}/k_{DMB} being in excess of about 2 and recovering a dewaxed oil product.

4,222,856

METHOD FOR PROMOTING REGENERATION OF A CATALYST IN A FLUIDIZED REGENERATOR

John H. Hansel, Media; Robert G. Linton, Orefield, both of Pa., and Charles W. Stanger, Jr., Brookfield, Ill., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 9, 1977, Ser. No. 805,193
Int. Cl.[3] **C10G** *11/02;* **C01B** *31/18;* **B01J** *23/92, 23/42*
U.S. Cl. 208—120 **4 Claims**



1. In a fluid catalytic cracking unit wherein a hydrocarbon feedstock is contacted in a reactor with a mass of a fluidized, finely divided zeolite catalyst, and converted to a hydrocarbon product, the hydrocarbon product separated from the catalyst, and the catalyst sent to a regenerator for effecting removal of carbonaceous material deposited on said catalyst, the improvement for enhancing the removal of carbonaceous material from the catalyst while in said regenerator without substantially affecting the performance of the catalyst which comprises:

fluidizing in physical admixture with the catalyst, finely divided frangible promoter particles comprising from about 500 parts per million to about 1% of a metal selected from the group consisting of platinum, palladium and mixtures thereof carried on a gamma alumina support in an amount to provide from about 0.15–50 parts per million metal by weight of the zeolite catalyst.

4,222,857

APPARATUS FOR SEPARATING SELECTED PARTICULATE MATERIALS FROM A MIXTURE OF SOLIDS AND LIQUIDS

James R. McCarthy, 623 Nevin Ave., Sewickley, Pa. 15143

Filed Dec. 15, 1977, Ser. No. 860,898
Int. Cl.[2] **B03B** *1/04, 5/70*
U.S. Cl. 209—9 **20 Claims**

18. An assembly for separating selected particulate material from a mixture of liquids and solids, said assembly comprising:

(a) means for introducing a chemical reagent into said mixture to prepare said selected particulate material in said liquids for separation from said mixture,

(b) a containing means for containing said reagent with said mixture

(c) means for supplying the mixture to said containing means

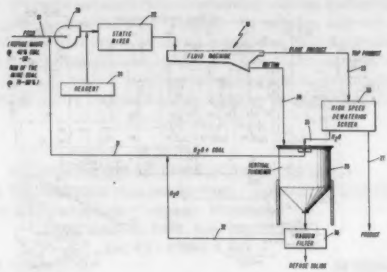
(c') said supplying means including static mixing means for mixing said chemical reagent with said mixture

(d) a trough shaped vessel having a mixture introducing end and a discharge end

(d') said discharge end having spaced apart upper outlet means and a lower outlet means

(e) means for delivering the reagentized mixture to said introducing end of said trough shaped vessel

(f) said vessel having a structural configuration having proportions such as to provide a continuous substantially quiescent movement of the mixture through said vessel from the introductory end to the discharge end,



(g) said upper outlet means having proportions such as to provide a discharge flow of liquid material out of said vessel to cause a free flow of said selected particulate material at the upper surface of the liquid in said mixture, and

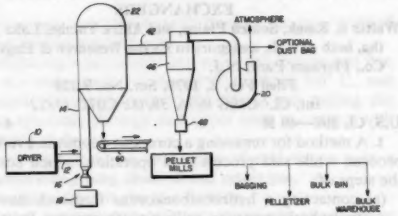
(h) said lower outlet having proportions such as to provide an impeded discharge flow of effluent material out of said vessel, whereby the combined amounts of material leaving the upper and lower outlet means substantially equals the amount entering the introductory end.

4,222,858

PARTICLE SEPARATOR

Maximo L. Avila, P.O. Box 402, Plymouth, Fla. 32768, and Edwin L. Cortez, P.O. Box 25, Ocoee, Fla. 32671

Filed Jun. 11, 1979, Ser. No. 47,006
Int. Cl.[2] **B07B** *4/02, 7/02*
U.S. Cl. 209—11 **21 Claims**



1. A particle separator for physically separating a mixture of small and large particles suspended in a stream of air comprising:

a. a chamber having a bottom and including an inverted truncated cone having an upper skirt forming a seal with the inner wall of said chamber and an aperture in the lower end of said cone for dividing said chamber into upper and lower compartments;

b. an inlet duct extending through the wall of said chamber into the upper compartment of said chamber for receiving the mixture;

c. filter means positioned within the lower compartment of

said chamber and having a first side surface forming a seal with the inner wall of said chamber and a second side surface forming a seal with the wall of said cone, said filter means defining an intermediate compartment in the upper portion of said lower compartment;

d. an outlet duct extending through the wall of said chamber into said intermediate compartment;

e. blower means coupled to said separator for producing a flow of air from said inlet duct through said upper compartment and through the aperture in said cone into said lower compartment, through said filter means into said intermediate compartment and out through said outlet duct; and

f. means coupled to the bottom of said chamber for removing large particles from said chamber;

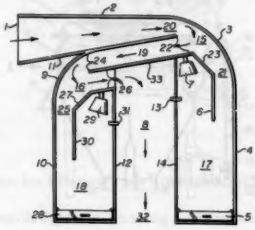
whereby large particles settle to the bottom of said chamber and are removed by said removing means and whereby small particles remain suspended in the flow of air, pass through said filter means and are discharged through said outlet duct.

4,222,859

PARTICLE SEPARATOR DEVICES

Curtis M. Medlock, Memphis, Tenn., assignor to Charles Medlock, Houston, Tex.

Filed Jan. 17, 1979, Ser. No. 4,154
Int. Cl.[2] B07B 7/02
U.S. Cl. 209—143 **18 Claims**



1. Apparatus for separating particulate matter from a flowing fluid, which comprises:

two side walls which each connect to every wall hereinafter mentioned to define chambers,

a first separation chamber having a curved outer wall and an inner wall which provides an inlet orifice and two outlet orifices,

a first collection chamber which communicates with the first separation chamber through one of the outlet orifices in said first separation chamber to receive particulate matter which has been separated from the fluid flow in said first separation chamber and which comprises a vessel having one inlet orifice and one outlet orifice of variable dimension to control the back-pressure encountered at the inlet orifice,

a second separation chamber having a curved outer wall and an inner wall which provides an inlet orifice and two outlet orifices,

said second separation chamber communicating with the first separation chamber through the inlet orifice of the second separation chamber and the outlet orifice of the first separation chamber which does not provide communication with a collection chamber,

a second collection chamber which communicates with the second separation chamber through one of the outlet orifices in said second separation chamber to receive particulate matter which has been separated from the fluid flow in said second separation chamber and which comprises a vessel having one inlet orifice and one outlet orifice of variable dimension to control the back-pressure at the inlet orifice.

4,222,860

METHOD FOR THE BENEFICIATION OF ORE

Moon C. Park, 105 Cal La., Sparks, Nev. 89431

Division of Ser. No. 721,988, Sep. 10, 1976, Pat. No. 4,119,532.
This application Jun. 14, 1978, Ser. No. 915,564
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.[2] B03B 5/60
U.S. Cl. 209—159 **5 Claims**

1. A beneficiation method not of the froth flotation type for separating severed ore into relatively heavy concentrate and relatively light gangue comprising:

placing severed ore in a vessel having an inlet at the bottom and an outlet at the top;

placing a horizontal screen without substantial vertical dimension across the vessel between the inlet and the outlet to define an upper zone of the vessel above the screen, the ore being initially disposed below the screen;

supplying water free of injected gases to the vessel through the inlet;

rotating a propeller in the vessel beneath the screen as the water is supplied and thereby causing said gas free water to flow upwardly from the inlet through the screen to the outlet carrying concentrate and gangue through the screen into the upper zone, whereby the presence of the screen minimizes the rotational flow of water and equalizes the water pressure in the upper zone, the gangue being carried upwardly and through the outlet by the water, while the concentrate remains in the vessel and moves downwardly through the screen due to its higher specific gravity; and

removing the concentrate from the vessel.

4,222,861

TREATMENT AND RECOVERY OF LARGER PARTICLES OF FINE OXIDIZED COAL

Robert E. Finch, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 807,770, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 696,460, Jun. 16, 1976, abandoned, and a continuation-in-part of Ser. No. 862,942, Dec. 21, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,974
The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.
Int. Cl.[2] B03D 1/02
U.S. Cl. 209—166 **5 Claims**

1. A method of increasing the yield of oxidized coal in the range 28×100 mesh (Tyler) undergoing a concentration treatment of froth flotation by using as a flotation promoter an invertible water-in-oil emulsion of sodium polyacrylate in a

dosage calculated as 0.017–0.5 lb of dry sodium polyacrylate per ton of dry coal.

4,222,862

FLOTATION OF OXIDIZED COAL WITH A LATEX EMULSION OF SODIUM POLYACRYLATE USED AS A PROMOTER

Robert E. Finch, Naperville, Ill., assignor to Nalco Chemical Company, Oakbrook, Ill.

Continuation-in-part of Ser. No. 807,770, Jun. 20, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,327
The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **5 Claims**

1. A method of increasing the yield of oxidized coal undergoing a concentration treatment of froth flotation by using as a flotation promoter in the presence of a hydrophilic activator to assist in inversion; an invertible water-in-oil emulsion, which is composed of a paraffinic liquid, a water-in-oil emulsifier, and sodium polyacrylate in a dosage calculated as 0.017–0.5 lb of dry sodium polyacrylate per ton of dry coal, said water-in-oil emulsion conforming to the following formula:

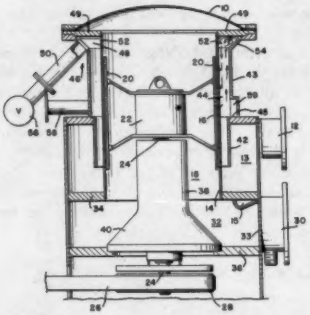
(1) 10–52.8% by wt. of the emulsion of an alkali metal polyacrylate
(2) 18–32% by wt. of the emulsion of a paraffinic liquid
(3) 67–15% by wt. of the emulsion of water
(4) 5–0.1% by wt. of the emulsion of a water-in-oil emulsifier.

4,222,863

SCREENING APPARATUS AND METHOD

Douglas L. G. Young, Beaconsfield, Canada, assignor to Ingersoll-Rand Canada Inc., Montreal, Canada

Filed Jan. 22, 1979, Ser. No. 5,368
Int. Cl.² B07B *1/20*
U.S. Cl. 209—273 **5 Claims**



1. A method of accumulating and removing both bouyant contaminants and denser contaminants from a single section of a pressurized screening apparatus comprising: feeding a suspension containing desirable fibers, undesirable bouyant contaminants, and denser contaminants into the pressurized screening apparatus; flowing said suspension into the bottom of and upwardly within a channel formed by a fixed screen and a fixed wall in the screening apparatus so that acceptable fiber will flow through the apertures in the screen and out of the housing; accumulating the bouyant contaminants and the denser contaminants in section in the housing above the channel; and removing both the bouyant contaminants and the denser contaminants from said section in the housing.

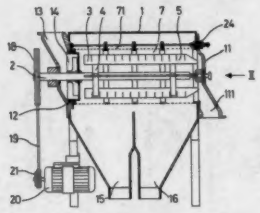
2. A pressurized screening apparatus for screening a liquid suspension containing desirable fiber, undesirable bouyant contaminants, and denser contaminants comprising: a housing; means for tangentially feeding the liquid suspension into the housing; a fixed enclosing screen in the housing having an axial apertured section extending around its periphery and forming an accepts chamber; an accepts outlet communicating with the accepts chamber; a fixed wall surrounding the enclosed screen to form an axially extending unobstructed annular channel defined by the outside of the screen and said wall; means for feeding the liquid suspension into the bottom of said annlar so that the liquid suspension flows upwardly within the axially extending annular channel; a contaminant accumulator section above said channel, said contaminant accumulating section being constructed to entrap bouyant contaminants and denser contaminants, and including an annular bouyant contaminant suspending zone directly above the axially extending unobstructed annular channel.

4,222,864

DRUM-TYPE SCREENING MACHINE

Alois Keller, Uzwil, Switzerland, assignor to Gebrueder Buehler AG, St. Gallen, Switzerland

Filed Jan. 31, 1978, Ser. No. 873,896
Claims priority, application Switzerland, Feb. 3, 1977, 1349/77
Int. Cl.² B07B *1/20*
U.S. Cl. 209—284 **15 Claims**



1. Drum type screening machine comprising a tubular screening drum, a shaft extending axially with respect to said drum, a centrifuging rotor mounted on said shaft for rotation within said drum, a feed inlet to said drum near an entry region of said drum, a perforate retaining element mounted on said shaft intermediate said feed inlet and said entry region, said screening drum having screening perforations and said retaining element having retaining perforations, said retaining perforations being larger than said screening perforations; and said retaining element having an axial length dimension, and being open to said feed inlet at its end proximate to said feed inlet and being perforate at its end axially remote from said feed inlet, and having an access aperture at its end axially remote from said feed inlet, said axially remote end including movable closure element and means for holding said closure element movably in position to close said access aperture.

4,222,865

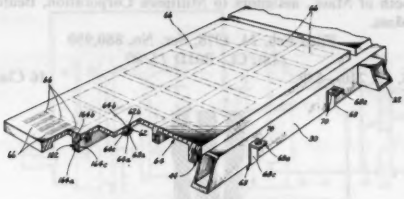
TROMMEL SCREEN UNIT

William J. Valeri, Pengilly, and Daniel O. Burkes, Hibbing, both of Minn., assignors to Irathane Systems Incorporated, Hibbing, Minn.

Filed Feb. 16, 1979, Ser. No. 12,880
Int. Cl.² B07B *1/22, 1/46*
U.S. Cl. 209—399 **23 Claims**

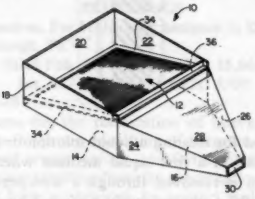
1. A screen unit comprising a screen panel of elastomeric material, rigid means extending along opposite sides of said screen panel, and a plurality of plastic reinforcing rods contained in spaced portions of said panel and having therein

portions overlying portions of said rigid means toward one side of said panel and free to move relative to said rigid means when



said rods are flexed by material engaging said one side of the panel.

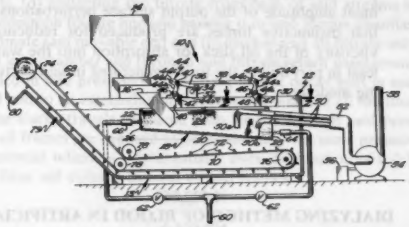
4,222,866
FILTER BOX
Wade Wilson, 2712 Finch St., Baton Rouge, La. 70807
Filed Jan. 5, 1979, Ser. No. 1,291
Int. Cl.[2] B07B *1/02*
U.S. Cl. 209—417 **4 Claims**



1. A filter box for filtering trash from sand, said box comprising:
a. a hexagonal bottom wall, having a rectangular portion and a trapezoidal portion;
b. a sidewall connected to and upwardly extending from each of the outer edges of said rectangular portion;
c. a tapered sidewall connected to and upwardly extending from each of the non-parallel edges of said trapezoidal portion, said tapered sidewalls being tapered downwardly towards the top end of said trapezoidal portion, and said tapered sidewalls being connected at their widest extent to said sidewalls at their ends most proximate said top of said trapezoidal portion;
d. a trapezoidal top wall overlaying at least a portion of said trapezoidal portion and connected to said tapered sidewalls to form an open ended funnel with said trapezoidal portion and said tapered sidewalls; and
e. a rectangular removable screen fittable within said sidewalls, said screen resting on one of its edges on said top wall and on the edge opposite, on said bottom wall.

4,222,867
COAL CLEANER
Theodore F. Garland, Apache Junction, Ariz., assignor to Garland Manufacturing Co., Ironton, Minn.
Filed Feb. 23, 1979, Ser. No. 14,344
Int. Cl.[2] B03B *5/18*
U.S. Cl. 209—427 **3 Claims**

1. Apparatus for cleaning particulate material such as coal and the like, said apparatus comprising:
feed means for supplying particulate material in pre-determined amounts;
a liquid confining tank;
a gravity type separator having first and second ends comprising a generally horizontally oriented perforate stratifying and classifying structure shiftably mounted in said liquid confining tank below and extending upwardly to the liquid level therein, said perforate structure first end receiving particulate material from said feed means for cleaning material which is mixed with other material having generally higher specific gravities, the bottom of said stratifying structure sloping downwardly from said first end to said second end;
oscillator means connected to said stratifying structure for oscillating the same and causing mixed material thereon to move from the inlet to the outlet thereof whereby lighter materials such as coal rise above the layer of heavier materials, and whereby the heavier material is discharged over the second end of the stratifying structure;
means for removing said heavier material from said tank;
a mechanism for removing lighter material comprising a



plurality of skimming means, said plurality being located intermediate of said first and second ends and being located above and adjacent said second end of said stratifying structure, said skimming means being arrayed in two rows transversely to said separator said first row being closer to said second end than to said first end, the second of said rows being closer to said second end than said first row, each of said rows comprising at least three skimming means located colinearly with respect to each other, the combined length of said skimming means extending substantially the width of said separator;
means located adjacent said first end for inducing fluid flow from said first end towards said second end; and
means located adjacent said second end for inducing fluid flow from said second end towards said skimming means and said first end.

4,222,868
ULTRASONIC OIL SPILL REMOVAL
Arthur Kuris, 3725 Henry Hudson Pkwy., Riverdale, N.Y. 10463
Continuation-in-part of Ser. No. 748,187, Dec. 7, 1976, Pat. No. 4,126,547. This application Nov. 8, 1978, Ser. No. 958,651
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.[3] C02F *1/36*
U.S. Cl. 210—748 **17 Claims**

6. A method of removing an oil slick layer of material from a water surface comprising the steps of:
A. vibrating a member having an output surface above the threshold range of the oil, so as to provide peak accelerations of at least 50,000 g,
B. transmitting the vibratory energy from said output sur-

face of said vibrating member to the water surface so as to transmit said vibrations to the oil and the water at the interface thereof,

C. homogenizing the oil and the water at the interface thereof so as to reduce the resulting mixtures viscosity whereby ready absorbtion into the body of water is obtained and the oil slick is removed,

D. disposing a reflecting surface beneath the oil slick,

E. producing periodic perturbations in the oil slick by applying to the body of water vibrations of essentially plane wavefronts from the output surface propagated along an axis substantially normal to said reflecting surface, and

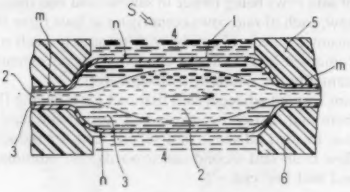
F. reflecting said vibrations back into the body of water along an axis substantially normal to said reflecting surface so that said reflecting vibrations are substantially in phase with said applied vibrations to increase the displacement amplitude of the output surface perturbations such that disjunctive forces are produced for reducing the viscosity of the oil slick for absorption into the water at least in part due to the forces generated in said perturbating medium.

4,222,869

DIALYZING METHOD OF BLOOD IN ARTIFICIAL KIDNEY

Isamu Kato, 2-6 Akebono-cho, Showa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Sep. 28, 1978, Ser. No. 946,556
Claims priority, application Japan, May 31, 1977, 52-116456
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—646 **3 Claims**



1. A method of dialyzing blood in an artificial kidney comprising the steps of:

(a) withdrawing blood from the circulatory system of a living being;

(b) directing said blood to an inlet of an artificial kidney, wherein said blood is forced through a blood circulation path comprised of a dialyzing membrane, said membrane having walls in contact with a dialyzing vessel, said vessel having a negative pressure area and a positive pressure area, and a dialyzing liquid circulating through said areas in said vessel;

(c) applying pulse pressure variations to said dialyzing liquid when said liquid is in said negative pressure area, thus including tension variations on a surface of said dialyzing membrane and isolating blood plasma from the blood onto a peripheral portion of said walls of said membrane, said membrane having a plurality of discharge holes which are repeatedly expanded and contracted in response to said pulse pressure variations to selectively force particles smaller than the diameter of said, holes and toxins contained in the blood through said holes; and

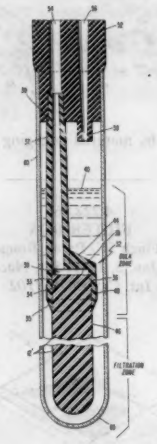
(d) adding filling-up substances contained in said dialyzing liquid in said positive pressure area to the blood by means of osmotic pressure.

4,222,870

ULTRAFILTRATION APPARATUS AND METHOD

Shmuel Sternberg, Lexington, and Steven S. Emmer, Newton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 24, 1978, Ser. No. 880,950
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—639 **16 Claims**



5. A method for treating a liquid solution or suspension of macromolecules in a first liquid medium whereby the first liquid medium is removed through a semi-permeable membrane filter, while simultaneously a second liquid medium is added directly to the first liquid medium, said method comprising the steps of:

(a) establishing and maintaining an overlying bulk zone, and an underlying filtration zone, both said zones being adjacent the same surface of the semi-permeable membrane filter in which the liquid being processed is maintained in a thin film adjacent the membrane surface,

(b) removing the first liquid medium from the filtration zone, by passing the liquid medium through the semi-permeable membrane filter, and

(c) substantially simultaneously adding an equivalent amount of the second liquid medium to the bulk zone.

4,222,871

IMPROVEMENTS IN THE SEPARATION OF LIQUID MIXTURES BY ULTRAFILTRATION

Antoine A. J. Lefeuvre, Ennery, France, assignor to Societe d'Etudes et de Realisations Industrielles - SERI, Bois-d'Arcy, France

Filed Apr. 28, 1978, Ser. No. 900,972
Claims priority, application France, May 5, 1977, 77 13704
Int. Cl.[2] B01C *13/00*
U.S. Cl. 210—636 **4 Claims**

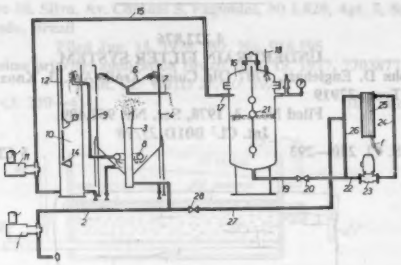
1. A method for separating liquid mixtures including at least one liquid of relatively high molecular weight, comprising the steps of:

(a) adding continuously a gas to the liquid mixtures at a high pressure;

(b) expanding the gas in the liquid mixtures down to a lower pressure suitable for ultrafiltration of the liquid mixtures;

(c) introducing subsequently the combined gas and liquid mixtures at the lower pressure into an ultrafilter having membranes inside for ultrafiltration; and

(d) cleaning the membranes inside the ultrafilter by turbulence caused by a release of bubbles of the gas in the liquid



mixtures, said release occurring due to the expanding upstream of said gas in the liquid mixtures.

4,222,872

RECLAMATION OF MOLYBDENUM OR OTHER HEAVY METALS FROM WASTEWATER TREATMENT SKIMMINGS

Ernest R. Ramirez, Far Hills, N.J., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1979, Ser. No. 15,664
Int. Cl.[2] C02B *1/20*; C02C *3/00*
U.S. Cl. 423—57 **8 Claims**

1. A process for the reclamation of heavy metal anions selected from the group consisting of tungsten, molybdenum, chromium, and arsenic anions, and ferric sulfate from wastewater skimmings resulting from the precipitation of said heavy metal anions from wastewater, by contact with ferric sulfate and formation of insoluble ferric heteropoly molybdate, tungstate, chromate and arsenate salts, followed by gas flotation and separation of said wastewater skimmings comprising:

(a) contacting said wastewater skimmings with an aqueous caustic at a temperature of 150°–225° F. for a period of time to form a solution of said heavy metal anions and a residual solids fraction which includes the ferric content of the skimmings;

(b) separating the solution of heavy metal anions so produced from said residual solids; and

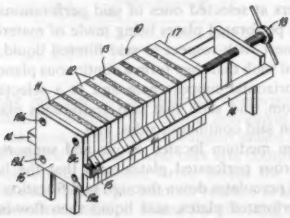
(c) contacting said residual solids with sulfuric acid to produce ferric sulfate.

4,222,873

PLATE AND FRAME FILTER PRESS HAVING MODIFIED FLOW PATTERN METHOD

Patrick J. Parsons, Edison, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 23, 1978, Ser. No. 936,173
Int. Cl.[2] B01D *29/08*
U.S. Cl. 210—777 **1 Claim**



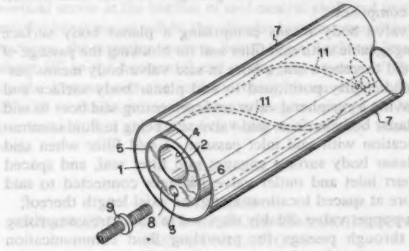
1. A method of filtering solids from a slurry containing solids, using filter aid in a plate and frame filter press having a fixed end defining inlet and outlet ports, and a movable end, a plurality of alternating plates supporting filter means and frames for accumulation of said filter aid and solids, said plates and frames being held between said ends, said plates and frames defining a common feed line extending from said inlet port, a common filtrate line, and a series of passageways from said common feed line to said common filtrate line and across said filter means, said common filtrate line terminating in a filtrate chamber proximate said movable end, and a filtrate return passageway defined in said press extending from said chamber to communicate with said filtrate outlet port, said method comprising the steps of (a) flowing said slurry under pressure through said inlet port into said common feed line, (b) dividing said slurry into a number of streams by passage from said common feed line into said series of passageways, (c) filtering each of said divided streams as it passes across a filter means, (d) collecting the filtrate from each of said streams in said common filtrate line and passing it to said filtrate chamber proximate said movable end and (e) discharging all filtrate only from said chamber and through said filtrate return passageway defined in said press and terminating in said outlet port in said fixed end to an external collecting means, wherein all the fluid of the slurry travels the same path length through said press and all frames are exposed to approximately the same pressure differential whereby a substantially even distribution of solids and filter aid collects in each of said frames.

4,222,874

BALANCED PRESSURE TUBULAR MOLECULAR FILTRATION SYSTEM

Robert F. Connelly, Akasaka, P.O. Box 101, Tokyo 107-91, Japan

Filed Jun. 20, 1977, Ser. No. 808,195
Claims priority, application Japan, Dec. 9, 1976, 51/148274
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—650 **17 Claims**



14. A method for carrying out reverse osmosis or ultrafiltration by using a molecular filtration device consisting of a semiporous core with semipermeable membrane on the outer profile, one or more internal passages with semipermeable membrane coated surfaces and one or more internal permeate ducts without membrane, and wherein said core is fitted with means for interconnecting, said core or a string of cores installed in pressure vessels terminating in 180 degree tubing returns and in which tubing returns are installed sections of pipe or tubing so positioned that they may be coupled directly to said core or terminal core in a string of cores, the diameter of the cores and pressure vessels being staged progressively smaller as the feed solution passes from the feed to the concentrate end of the core bank so that the velocity of the solution past the membrane surfaces may be controlled within the ranges in which the fouling occurs and in which pumping efficiency decreases, said staging in diameters of cores and pressure vessels being facilitated by the use of tubing reducers connected between pressure vessels and bent tubing returns at appropriate places within the core bank so that the linear flow rates are increased at the points of transition from one diameter to the next smaller

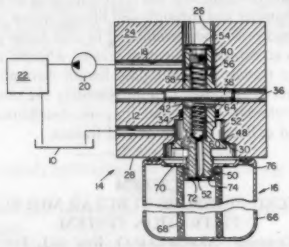
diameter, said permeate ducts equipped with suitable connectors, with all materials employed in said core, connectors, seals and allied parts being composed of organic substances, in which method a radioactive or toxic substance is treated and concentrated, and in which, after exhaustion of the core or termination of the process, the residual core, and all ot its attached parts are decomposed by a thermal or chemical process, thereby yielding the minimum weight and volume of residual inorganic ash.

4,222,875

FILTER ELEMENT SHUTOFF VALVE

William J. Sikula, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 18, 1978, Ser. No. 897,379
Int. Cl.[2] B01D *27/04, 27/10;* **F16K** *17/06*
U.S. Cl. 210—235 **9 Claims**



1. A fluid shutoff valve engageable with a filter element which has an inlet and an outlet passage, a planar filter seal which encircles said inlet and outlet passages, and a threaded female portion aligned axially perpendicular to said filter seal and connected to said outlet passage, wherein said shutoff valve comprises:

(a) valve body means comprising a planar body surface engageable with said filter seal for blocking the passage of fluid therebetween, a bore in said valve body means perpendicularly positioned to said planar body surface and having a peripheral valve seat connecting said bore to said planar body surface, said valve seat being in fluid communication with said inlet passage of said filter when said planar body surface engages said filter seal, and spaced apart inlet and outlet valve passages connected to said bore at spaced locations along the axial length thereof;

(b) a poppet valve slidably disposed in said bore comprising a through passage for providing fluid communication between said outlet passage of said filter and said outlet passage of said valve, a peripherally positioned poppet seal surface engageable with said valve seat for blocking the passage of fluid therebetween, a threaded male portion located at one end of said poppet valve which encircles said through passage and is engageable with said female portion of said filter element, engaging said threaded portions disengages said poppet seal surface from said valve seat after said filter seal abuts said planar body surface which allows fluid communication between said inlet passage of said valve and said inlet passage of said filter and also between said outlet passage of said valve and said outlet passage of said filter;

(c) slot means provided in both said valve body means and said poppet valve which extend therethrough distal from said valve seat, said slot means intersecting said through passage of said poppet valve;

(d) pin means disposed in said slot means positioned between said inlet and outlet passages and extending through said poppet valve for preventing rotation of said poppet valve in said bore; and

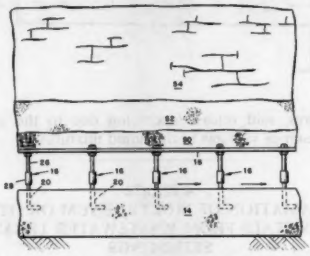
(e) biasing means disposed in said through passage abutting said pin means and said poppet valve for urging said poppet valve to a position wherein said poppet seal surface can engage said valve seat.

4,222,876

UNDERDRAIN FILTER SYSTEM

John D. Englehart, 8707 Old Colony Trail, Apt. 3, Knoxville, Tenn. 37919

Filed Nov. 3, 1978, Ser. No. 957,489
Int. Cl.[2] B01D *23/18*
U.S. Cl. 210—293 **5 Claims**



1. A modular underdrain filtration system for filtering a selected liquid comprising:

a container having a horizontal support base and continuous sides extending above said support base to a selected height, said container being made of a material impervious and inert with respect to the liquid being filtered, said support base including means for routing the liquid in a selected direction and said container sides defining an aperture for allowing the escape of the said filtered liquid;

a multiplicity of support members rigidly attached to said horizontal support base and extending to the interior of said container, said support members being made of a material substantially inert with respect to said liquid being filtered, said support members comprising adjustable anchor bolts which include a first portion rigidly attached to said support base at one end and threaded on the other end, a second portion threaded on its first end and having a second end suitable for securing plates thereto, a sleeve having a first set of threads cut at one end for mating with said threaded end of said first portion, and a second set of threads cut at the second end of said sleeve for mating with said threads on said first end of said second portion, said threads on said sleeve and said first and second portions being arranged such that the length of said anchor bolt can be adjusted by turning said sleeve on its longitudinal axis;

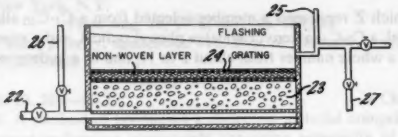
a plurality of non-porous plates, each of said plurality of non-porous plates defining a multiplicity of perforations and each said plate being rigidly attached to said support members at selected ones of said perforations, said non-porous perforated plates being made of material substantially inert with respect to said filtered liquid, and being oriented such that they form a continuous plane parallel to said horizontal support base and at a selected distance therefrom, and such that said continuous plane extends between said continuous sides; and

a filtration medium located above and supported by said non-porous perforated plates such that the liquid to be filtered percolates down through said filtration medium to said perforated plates, said liquid then flowing through said multiplicity of perforations into the space defined by said perforated plates and said container support base and sides, said liquid then being routed by said routing means through said aperture and out of said container.

4,222,877
UTILIZATION OF NON-WOVEN FABRICS IN WATER TREATMENT

Leziro M. Silva, Av. Coronel S. Fagundes, N) 1.429, Apt. 5, Sao Paulo, Brazil

Filed Jun. 14, 1978, Ser. No. 915,195
Claims priority, application Brazil, Jun. 15, 1977, 7703877
Int. Cl.[2] B01D *23/10, 39/02*
U.S. Cl. 210—411 10 Claims

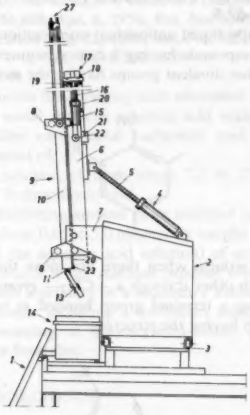


1. A filter for filtering water, comprising a lower horizontal water-pervious supporting means, filtering blanket of uniform thickness lying on and supported by said lower supporting means, said blanket comprising superposed layers of non-woven fabric comprising felted fibers selected from the group consisting of synthetic fibers and inorganic fibers, an upper water-pervious supporting means of overlying said blanket to confine said blanket between said lower supplying means and said upper supporting means, means for supporting raw water under pressure to pass through said blanket in one direction to filter said water and means for passing washwater through said blanket in the opposite direction to back-wash said filter.

4,222,878
RAKING EQUIPMENT FOR TRASHRACKS

Hans Hansson, Mölneby Basgarden, 510 60 Överlida, Sweden

Filed Oct. 10, 1978, Ser. No. 949,691
Claims priority, application Canada, Oct. 11, 1977, 288430
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—413 3 Claims

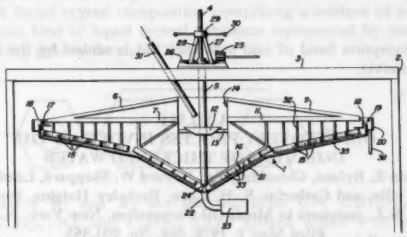


1. A raking machine for a trashrack comprising support means displacably mounted for lateral movement along the trashrack, a rake arm carried by said support means for vertical movement along the trashrack, said rake arm comprising inner and outer telescopic members, drive means for lifting and lowering said outer telescopic member relative to said support means and drive transmission means for effecting telescoping movements of said inner member relative to said outer member responsive to movements of said outer member relative to said support means, said drive transmission means comprising a wire and pulley system including a first pulley means at the upper end of said outer member, a wire trained around said pulley means having its ends fixed relative to said support means, said wire including a bight internally of said outer member, said inner member being suspended from said bite.

4,222,879
SETTLING CLARIFIER

Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,870
Int. Cl.[2] B01D *21/18*
U.S. Cl. 210—520 2 Claims



1. In clarification apparatus comprising a vessel defined by a circular vertical wall and a circular bottom sloping toward a central underflow exit, a rake arm suspended across said vessel and rotating on a central shaft, rakes suspended on said rake arm for sweeping solids settled on said bottom toward said exit, a peripheral overflow weir at the top of said circular wall, and means for feeding liquid toward the center of said vessel; the improvement comprising a deflector plate to receive and deflect liquid feed, a stilling well to receive deflected liquid; a vertical screw at the bottom of said central shaft and over said exit for breaking up solids; the circular bottom comprising two sections, the exterior section being at an angle of less than about 10° to the horizontal and occupying an area of 70–90% of the bottom and the interior being at an angle of about 25°–30° to the horizontal and occupying an area of 10–30% of the bottom; and the rake arm being substantially above the weir.

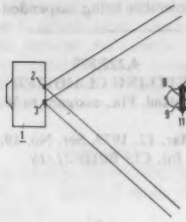
4,222,880
ARRANGEMENT FOR OPTICAL TRANSMISSION OF COMMUNICATIONS

Guenter Baur, Freiburg; Waldemar Greubel, Munich; Rudolf Knauer, Ottobrunn, and Hans Krueger, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,569
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1977, 2742899
Int. Cl.[3] H04B *9/00;* H04N *5/33, 5/44;* G02B *5/20*
U.S. Cl. 455—617 19 Claims

1. In an arrangement for optical transmission of communications including at least one light transmitter and a light receiver which is assigned to each of the light transmitters, each of said light receivers being provided with a light gathering means consisting of a body of a material having an index of refraction greater than 1 with the improvement comprising said means converting a major part of the transmitted radiation into a band of different radiation and output coupling the band of different radiation at an increased intensity at an light outlet window optically coupled with the respective light receiver, each of said bodies containing a fluorescent substance and being a fluorescent body, said fluorescent substance having an absorption band, which approximately conforms with the emission

band of the associated light transmitter, said fluorescent substance having an emission band which does not overlap the



absorption band of said substance but is sensed by the light receiver.

4,222,881

OIL RECOVERY PROCESS INVOLVING THE INJECTION OF THICKENED WATER

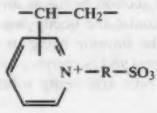
Don E. Byham, Glenolden, Pa.; Edward W. Sheppard, Lambertville, and Catherine S. H. Chen, Berkeley Heights, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,555

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **10 Claims**

1. In a method for the recovery of oil from an oil-containing subterranean reservoir penetrated by spaced injection and production systems wherein fluid is introduced into said reservoir via said injection system to displace oil therein to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid containing a water-soluble copolymer having a molecular weight of at least 50,000 and including at least 20% by weight of quaternary pyridinium sulfonate monomers of the formula:



wherein R is a C_1–C_4 alkylene group copolymerized with a water-insoluble alpha olefin or hydrogenated diene, said polymer being present in said aqueous liquid in a concentration sufficient to increase the viscosity thereof at the temperature of said reservoir.

4,222,882

POLYMERS BEARING GROUPS DERIVED FROM N-SUBSTITUTED LACTAMS AND THEIR USE AS LUBRICATING OIL ADDITIVES

Daniel Brulet, Claye Souilly; Robert Pocheville, Paris, and Bernard Chauvel, Ermont, all of France, assignors to Rhone-Poulenc Industries, Paris and l'Institut Francais du Petrole, Rueil Malmaison, both of, France

Filed Jan. 26, 1979, Ser. No. 7,032

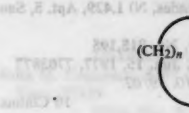
Claims priority, application France, Feb. 8, 1978, 78 03460; Feb. 8, 1978, 78 03461

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 A **32 Claims**

1. A lubricating oil polymer additive produced in accordance with the process which comprises:

subjecting a living polymer of number average molecular weight (Mn) of between about 20,000 and 300,000, said living polymer being prepared by anionic polymerization of at least one C_4-C_6 conjugated diene or a copolymer of a C_4-C_6 conjugated diene with a vinyl aromatic compound to a functionalization operation by reaction with an N-substituted lactam of the formula:



(I)

in which Z represents a member selected from a C_1-C_{20} alkyl radical, a C_2-C_{10} alkenyl radical, a phenyl radical, and n represents a whole number from about 2 to 11; and to a hydrogenation.

4,222,883

4,4'-FURFURYLIDENE BIS(2,6-DI-TERT-BUTYLPHENOL)ANTIOXIDANT

Ernest Clinton, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 790,533, Apr. 25, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,347

Int. Cl.[2] C07F *307/42*

U.S. Cl. 252—52 R **4 Claims**

1. The antioxidant compound 4,4'-furfurylidene bis(2,6-di-tert-butylphenol).

2. A lubricating oil composition containing an antioxidant amount of the compound of claim 1.

4,222,884

ANTIOXIDANT

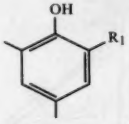
Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 4, 1978, Ser. No. 966,028

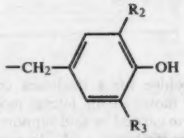
Int. Cl.[2] C10M *1/20, 3/14*; C10L *1/18*

U.S. Cl. 252—52 R **12 Claims**

1. A normally liquid antioxidant composition comprising a mixture of compounds having a central segment made up of one to about ten divalent groups having the structure:



said divalent groups, when there are more than one, being bonded to each other through a —CH_2— group, said central segment having a terminal group bonded at each end, said terminal group having the structure:



wherein R_1 and R_2 are selected from the group consisting of α-branched alkyl radicals containing 3 to about 12 carbon atoms, cycloalkyl radicals containing 5 to about 8 carbon atoms and aralkyl radicals containing 8 to about 12 carbon atoms and R_3 is selected from the group consisting of alkyl radicals containing 1 to about 12 carbon atoms, cycloalkyl

radicals containing 5 to about 8 carbon atoms and aralkyl radicals containing 8 to about 12 carbon atoms.

4,222,885

METHOD OF PRODUCING A DIELECTRIC WITH PEROWSKITE STRUCTURE AND CONTAINING A COPPER OXIDE

Detlev Hennings, and Herbert Schreinemacher, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,028

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736688

Int. Cl.[2] H01B *3/12*

U.S. Cl. 252—63.2 **4 Claims**

1. A method of producing a dielectric material comprising perowskite-forming compounds consisting essentially of one or more of the group of stoichiometric alkaline earth titanates, alkaline earth zirconates, alkaline earth stannates and mixed crystals thereof, said method comprising the steps of:

admixing, with said perowskite-forming compounds, a quantity of eutectic-forming compounds which cannot be incorporated into the perowskite lattice to any substantial extent and which are capable of forming $CuO.MeO_x$ when sintered in an oxygen atmosphere, where MeO_x is at least one oxide of an element from group III, V, VI or VII of the periodic system of element; and

sintering said admixture, at a partial oxygen pressure of 0.2–1 Bar, in the temperature range of from 1000°–1250° C., said eutectic-forming compounds being present in sintering temperature lowering amounts.

4,222,886

PUMPABLE PIPE CLEANING COMPOSITION

George F. Connelly, Jr., Golf Rd. and Perkins Blvd., Grand Beach, Mich. 49117

Continuation-in-part of Ser. No. 799,282, May 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 593,037, Jul. 3, 1975, Pat. No. 4,025,359, which is a continuation-in-part of Ser. No. 456,468, Apr. 1, 1974, Pat. No. 3,969,255. This application Aug. 21, 1978, Ser. No. 935,538

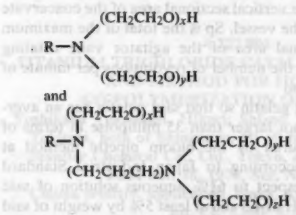
Int. Cl.[2] C23G *1/06*

U.S. Cl. 252—149 **10 Claims**

1. A composition for cleaning scale encrusted copper, steel or galvanized metal surfaces wherein said scale includes at least one alkaline earth metal carbonate, said composition consisting essential of:

an aqueous solution of from about 7.5 to 25 percent by weight of hydrochloric acid,

a corrosion inhibiting amount of an inhibitor system including from about 0.05 to 5.0 percent by weight (based on the weight of the aqueous acid solution) of an amine-based inhibitor which is the reaction product of an acetylenic alcohol with a primary or a secondary amine, said amine-based inhibitor including a solubilizer selected from the group consisting of polyoxylated mono and diamines having the formulae:



and

wherein R is an aliphatic hydrocarbon radical having from 8 to 22 carbon atoms and x, y and z are integers, the sum of which is from 2 to 50, and;

an effective amount of a polydimethylsiloxane anti-foam agent, said siloxane having a viscosity of about 100 centistokes at 25° C.

4,222,887

LIQUID CRYSTAL COMPOSITION

Yohji Matsufuji, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

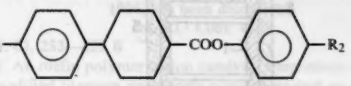
Filed Jul. 11, 1978, Ser. No. 923,732

Claims priority, application Japan, Jul. 19, 1977, 52-87008

Int. Cl.[2] C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 **25 Claims**

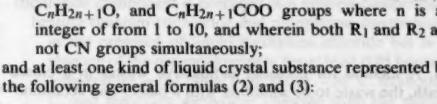
1. A liquid crystal composition comprising a mixture of at least one kind of liquid crystal substance represented by the following general formula (1):



(1)

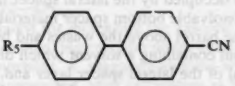
wherein R_1 and R_2 are selected from CN, C_nH_{2n+1}, $C_nH_{2n+1}O$, and $C_nH_{2n+1}COO$ groups where n is an integer of from 1 to 10, and wherein both R_1 and R_2 are not CN groups simultaneously;

and at least one kind of liquid crystal substance represented by the following general formulas (2) and (3):



(2)

wherein R_3 and R_4 are selected from CN, C_nH_{2n+1}, $C_nH_{2n+1}O$, and $C_nH_{2n+1}COO$ groups where n is an integer of from 1 to 10, and wherein both R_3 R_4 are not CN groups simultaneously;



(3)

wherein r_5 is selected from C_nH_{2n+1}, $C_nH_{2n+1}O$, and $C_nH_{2n+1}COO$ groups where n is an integer of from 1 to 10.

4,222,888

LIQUID CRYSTAL MATERIALS CONTAINING A DIPHENYLETHANE NUCLEUS

Jean-Claude Dubois; Tinh H. Nguyen, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

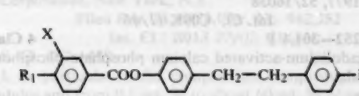
Filed May 3, 1979, Ser. No. 35,718

Claims priority, application France, May 30, 1978, 78 13519

Int. Cl.[2] C07C *69/84, 121/75*; C09R *3/34*

U.S. Cl. 252—299 **5 Claims**

1. Liquid crystal materials of the formula:



wherein R_1 represents an alkoxy group having n carbon atoms (n being an integer from 1 to 10), R_2 represents an alkyl group having m carbon atoms (m being an integer from 1 to 10) and X represents bromine or the cyanide group.

4. A liquid crystal mixture which comprises a material of the formula of claim 1 and the para-methoxybenzoate of parapentyl phenol.

4,222,889

METHOD FOR ENCASING WASTE BARRELS IN A LEACHPROOF CLOSED SHEATH

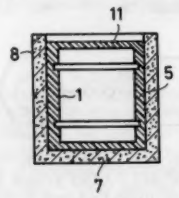
Ernst-Peter Uerpmann, Osterode, Fed. Rep. of Germany, assignor to Gesellschaft für Strahlen- und Umweltforschung mbH, München, Neuherberg, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,670

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741661

Int. Cl.² B65D *85/54;* B65B *3/04*

U.S. Cl. 252—301.1 R 7 Claims



1. A method for encasing radioactive wastes in a closed sheath, the waste to be solidified with a binder and accommodated in a barrel, and the closed sheath to be resistant to water and aqueous solutions of natural mineral salts and to leaching, which comprises:

applying a bottom layer of a synthetic resin or a dissolvable spacer material on the bottom of the inside of a waste barrel;

applying a lateral spacer layer inside the barrel along the walls to occupy the space of the lateral portion of a sheath to be applied around the waste;

filling the wastes together with the binder into the barrel up to or to below the height of the lateral spacer layer and permitting the wastes and binder to set; and then

filling the spaces occupied by the lateral spacer layer and, if present, the dissolvable bottom spacer material, as well as the space in the barrel above the wastes and binder, with a synthetic resin containing a solvent which dissolves the spacer material of the lateral spacer layer and, if present, the dissolvable bottom spacer material, whereby the synthetic resin forms a sheath completely surrounding the wastes and binder, which sheath has a firm and tight mechanical bond of its sides with its top and bottom.

6. The encased radioactive waste product produced by the method of claim 1.

4,222,890

GADOLINIUM-ACTIVATED PHOSPHATE PHOSPHOR

Takeshi Takahara, Yokosuka; Toshio Nishimura, and Akira Fujita, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 852,530, Nov. 17, 1977, abandoned. This application Jan. 17, 1979, Ser. No. 4,264

Claims priority, application Japan, Nov. 22, 1976, 51/139514; Feb. 18, 1977, 52/16038

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 P 4 Claims

1. A gadolinium-activated calcium phosphate phosphor of the formula:

$$(Ca_{1-x-y}Gd_xM_y)_3(PO_4)_{(2+x-y)z}$$

wherein M is at least one member selected from the group consisting of thallium and silver; $0.005 \leqq x \leqq 0.35$, y is greater than zero and less than 0.1, and $0.7 \leqq z \leqq 1.9$ and wherein M is present in an amount sufficient to effect a brightness that is greater than that of the phosphor absent M; said phosphor emitting ultraviolet rays having a wavelength ranging between 280 to 330 nm when excited by ultraviolet rays having a wavelength of 254 nm, and exhibiting a line spectrum corresponding to a wavelength approximating 312 nm.

4,222,891

METHOD OF MAKING OIL-CONTAINING MICROCAPSULES

Tomoyuki Okimoto, Takarazuka; Tomoharu Shiozaki, Amagasaki, and Makoto Miyake, Nishinomiya, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,318

Claims priority, application Japan, Aug. 17, 1977, 52-98924; Nov. 25, 1977, 52-142011

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 20 Claims

1. In a method for making oil-containing microcapsules for pressure-sensitive copying papers comprising the steps of:

(1) preparing an aqueous system comprising an aqueous solution of gelatin and at least one anionic colloid material and oil droplets dispersed in said solution; (2) causing coacervation in said aqueous system at a temperature above the gelation point of said gelatin to form a coacervation suspension in which each of said oil droplets is surrounded by a coacervate; and

(3) cooling said coacervate suspension to a temperature below the gelation point of said gelatin to form multinucleus capsules while subjecting said oil droplets each having a coacervate therearound to an agitation flow,

the improvement whereby multi-nucleus microcapsules having an average diameter within the range of 3 to 20 microns are formed and more than 75% of the microcapsule particles belong to the peak channel and its adjoining channels in the volume integration of particles measured by Coulter Counter, said improvement consisting essentially of

(A) producing said agitation flow by rotating at least one agitator having at least one vane in a vessel containing said coacervate suspension under the following conditions:

$$0.3 \leqq (2a/D) < 1$$

$$0.05 \leqq (Sp/ST) < 1$$

$$5 > n \leqq 200$$

wherein D is the maximum inner diameter of the vessel, a is the maximum radius of gyration of the agitator, ST is the maximum vertical sectional area of the coacervate suspension in the vessel, Sp is the total of the maximum vertical sectional area of the agitator vane rotating spaces and n is the number of revolutions per minute of the agitator; and

(B) selecting said gelatin so that said gelatin has an average viscosity not larger than 35 millipoise in terms of the valuemeasured by the bloom pipette method at 40°±0.5° C. according to Japan Industrial Standard K6503 with respect to 6⅔% aqueous solution of said gelatin at the pH of 4.5 and at least 5% by weight of said gelatin has a viscosity not larger than 25 millipoise in the same terms as defined.

4,222,892

PROCESS FOR PREPARING OXINE IMPREGNATED-ACTIVATED CHARCOAL

Kenji Motojima; Enzo Tachikawa, and Hideo Kamiyama, all of Mito, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,824
Claims priority, application Japan, Jul. 21, 1977, 52/87678
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—428 3 Claims

1. A process for preparing oxine adsorbed-activated charcoal which comprises contacting solid oxine with activated charcoal until the activated charcoal becomes impregnated with the oxine.

2. The process of claim 1, wherein the contact of the solid oxine with the activated charcoal is carried out in the air.

3. The process of claim 1, wherein the contact of the solid oxine with the activated charcoal is carried out in water.

4,222,893

PROCESS FOR FORMING HIGH PERFORMANCE TITANIUM TRICHLORIDE OLEFIN POLYMERIZATION CATALYST COMPONENTS

Nicholas M. Karayannis, and Harold Grams, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 735,161, Oct. 26, 1976, abandoned.
This application Apr. 3, 1978, Ser. No. 892,663
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B 8 Claims

1. In a process for preparing a brown solid comprising beta titanium trichloride and some, up to 10 mole percent, of at least one hydrocarbyl ether, said brown solid having a surface area above about eighty square meters per gram and a pore volume above about one-tenth cubic centimeter per gram and made by a process comprising

(a) reducing titanium tetrachloride with a lower alkyl dihydrocarbylaluminum halide at a temperature below about 0° C.,

(b) raising the temperature of the product of (a) to less than about 100° C.,

(c) incorporating the solid product of (b) with at least one hydrocarbyl ether, and

(d) thereafter treating the solid product of (c) with a solution in an inert liquid of an electron pair acceptor compound selected from the group consisting of titanium tetrachloride, titanium alkoxyhalide, aluminum bromide, germanium tetrachloride, silicon tetrachloride, and other periodic Group IVB, IVA, and VA halides under conditions of temperature, time, concentration of said acceptor compound dissolved in said inert liquid, and mole ratio of acceptor compound to titanium contained in the solid from (c) which convert said solid from (c) into a brown solid having a surface area of about eighty square meters per gram and a pore volume of about one-tenth cubic centimeters per gram,

the improvement wherein a lower alkyl alkylaluminum dihalide is employed in (a) in an amount such that the molar ratio of dihydrocarbylaluminum halide to alkylaluminum dihalide ranges from about 0.5:1 to about 10:1.

4,222,894

TITANIUM TRICHLORIDE CATALYTIC COMPONENT AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Yoshikazu Takahashi, Hikari; Shizuo Tomiyasu, and Masaru Takitani, both of Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,695
Claims priority, application Japan, Aug. 31, 1977, 52-104349
Int. Cl.[3] C08F *4/64*
U.S. Cl. 252—429 B 18 Claims

1. A titanium trichloride catalytic component manufactured by pulverizing an eutectic mixture or a crystalline compound consisting of titanium trichloride and aluminum chloride or a pulverized matter obtained therefrom, together with 2–20 parts by weight per 100 parts of said eutectic mixture, crystalline compound or matter obtained therefrom, of an organic compound selected from the group consisting of a carboxylic acid and an anhydride thereof at a temperature within the range of 35°–100° C. in the absence of a solvent and without an extractive process carried out with said solvent.

4,222,895

POLYOLEFIN CATALYST

John L. H. Allan, Glen Rock, and Birendra K. Patnaik, Parsippany, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 908,485, May 22, 1978, Pat. No. 4,154,702. This application May 4, 1979, Ser. No. 36,200
The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B 14 Claims

1. An olefin polymerization catalyst composition containing a modified titanium trichloride component and an organoaluminum cocatalyst component, wherein the modified titanium trichloride component is prepared in a process comprising:

heating titanium trichloride and phosphorus oxytrichloride in the presence of liquid methylene chloride but in the absence of the organoaluminum for at least 0.25 hours at a temperature in the range from about −20° C. to about 60° C. and removing methylene chloride from the modified titanium trichloride.

4,222,896

MAGNESIA-ALUMINA-ALUMINUM PHOSPHATE-ZEOLITE CATALYST

Harold E. Swift, Gibsonia; John J. Stanulonis, Pittsburgh, and Elizabeth H. Reynolds, Verona, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 958,628, Nov. 8, 1978, Pat. No. 4,179,358. This application Jul. 16, 1979, Ser. No. 57,658
Int. Cl.[3] B01J *27/14*
U.S. Cl. 252—437 9 Claims

1. A catalyst for increasing the gasoline yield and quality in a petroleum cracking reaction under catalytic cracking conditions comprising a magnesia-alumina-aluminum phosphate matrix characterized, after calcination at 500° C. for 10 hours, as amorphous, having an average pore radius of from about 10 A to about 200 A; a surface area ranging from about 100 M^2/g to about 350 M^2/g; a pore volume of from about 0.3 cc/g to about 1.5 cc/g; and wherein the magnesia-alumina-aluminum phosphate matrix has a mole percent ratio of from about 10:80:10 to about 25:10:65, and wherein said matrix retains at least 90% of its surface area when the matrix is additionally calcined at a temperature up to about 750° C. for about 10 hours; said matrix being composited with from about 5 to about 50 weight percent of a zeolite having cracking activities.

4,222,897

SORBENT FOR REMOVING METALS FROM FLUIDS

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1978, Ser. No. 942,252
Int. Cl.[2] B01J *27/02, 23/34*
U.S. Cl. 252—439 7 Claims

1. A particulate solid composition comprising manganese nodules and from 0.1 wt. % to about 60 wt. % of said nodules of added sulfur, said added sulfur being occluded in said nodules.

6. A method for preparing a sorbent for metals dispersed in fluids which comprises mixing manganese nodules with from 0.1 wt. % to about 60 wt. % of said nodules of elemental sulfur

and heating the mixture to a temperture above about 100° C. for a time effective to form occluded sulfur.

4,222,898

ZERO-VALENT MIXED METAL CATALYSTS AND PROCESS OF PREPARATION

Jan G. Noltes, Huis Ter Heide; J. T. B. H. Jastrzebski, De Bilt, and Gerard van Koten, Bilthoven, all of Netherlands, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 7, 1979, Ser. No. 18,372

Int. Cl.[2] B01J *23/46*

U.S. Cl. 252—447 **13 Claims**

1. A process for the preparation of a zero-valent mixed metal catalyst comprising reacting an organic metal cluster compound conforming to the formula $R_{x+y}M_xLi_y$ where R is alkyl of 1–12 carbon atoms, M is a Group IB metal, x and y are each 1–4, and x+y is 2–8, with a rhodium halide complex of the formula RhX_aL_b where X is chlorine or bromine, L is an olefinic hydrocarbon ligand, a is 1–3 and b is 1–4, in a hydrocarbon solvent.

4,222,899

AMMOXIDATION CATALYST

Robert A. Innes, Monroeville, and William L. Kehl, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 972,933

Int. Cl.[3] B01J *21/06, 23/18, 23/22, 23/28*

U.S. Cl. 252—469 **9 Claims**

1. The novel catalyst wherein the atomic ratios of the components thereof are defined by the following empirical formula:

$$USb_aX_bY_cO_d,$$

wherein X is an element from Group IV B of the Periodic Table; Y is at least one element selected from the group consisting of molybdenum and vanadium; a is a number falling within the range of about 1.35 to about 2.75; b is a number falling within the range of about 0.25 to about 1.65; c is a number falling within the range of about 0.05 to about 0.2, d is a number falling within the range of about 8 to about 12; and the sum of a+b is a number falling within the range of about 2.5 to about 3.5.

4,222,900

METHOD OF ACTIVATING A PALLADIUM-SILVER ALLOY

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 940,049, Sep. 6, 1978. This application Jun. 25, 1979, Ser. No. 51,664

Int. Cl.[3] B01J *23/44, 23/50*

U.S. Cl. 252—474 **1 Claim**

1. A method of activating a Palladium-Silver alloy to make it reactive to hydrogen comprising the steps of:

providing a Palladium-Silver alloy having an outer surface,

etching said outer surface with concentrated nitric acid;

rinsing said outer surface with water;

etching said outer surface with a boiling Potassium-hydroxide solution.

4,222,901

ELECTROCONDUCTIVE POLYMERS HAVING IMPROVED SOLVENT HOLDOUT PROPERTIES

Gloria D. Sinkovitz, Bridgeville, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1978, Ser. No. 960,806

Int. Cl.[2] H01B *1/00*

U.S. Cl. 252—500 **4 Claims**

1. An improved electroconductive resin coating composition containing a copolymer of a water-soluble quaternary ammonium conductive monomer and at least 15, but less than 30, percent by weight-acrylamide.

4,222,902

SEMICONDUCTIVE AND SENSITIZED PHOTOCONDUCTIVE COMPOSITIONS

William A. Huffman, Minneapolis; Stephen P. Birkeland, White Bear Lake, and Kevin P. O'Leary, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 743,171, Nov. 19, 1976, Pat. No. 4,134,764, which is a division of Ser. No. 556,400, Mar. 7, 1975, Pat. No. 4,052,209. This application Nov. 3, 1978, Ser. No. 957,663

Int. Cl.[2] A01B *1/00*

U.S. Cl. 252—500 **9 Claims**

1. A semiconductive composition comprising an organic polymeric binder of high dielectric strength and a dye comprising at least two quinoid benzene rings linked through a bridging moiety selected from the class of cycloproprane, cyclobutane and $-(C{=}C)_n-$, wherein n is 1 or 2, and wherein any ring carbons of the cyclopropane and cyclobutane bridging moieties not directly bonded to quinoid benzene rings are bonded to oxygen atoms to complete a carbonyl group wherein said dye is present in a concentration of at least $0.5\times10^{31.6}$ moles of dye/mole of binder.

4,222,903

P-TYPE ELECTRICALLY CONDUCTING DOPED POLYACETYLENE FILM AND METHOD OF PREPARING SAME

Alan J. Heeger, Wynnewood; Alan G. MacDiarmid, Drexel Hill; Chwan K. Chiang, Upper Darby, all of Pa., and Hideki Shirakawa, Yokohama, Japan, assignors to University Patents, Inc., Norwalk, Conn.

Filed May 4, 1978, Ser. No. 902,667

Int. Cl.[2] H01B *1/06*

U.S. Cl. 252—518 **13 Claims**

1. In a method of selectively modifying the room temperature electrical conductivity of a semiconducting polyacetylene starting material by means of chemically doping said polyacetylene to p-type with a conductivity-increasing amount of an electron acceptor dopant, the improvement consisting of said polyacetylene starting material being in the form of a polycrystalline film, whereby the range of selectivity of the room temperature p-type electrical conductivity of the resulting doped material is broadened to extend over the entire range characteristic of semiconductor behavior and into the range characteristic of metallic behavior.

4,222,904

13-OXABICYCLO[10.3.0]PENTADECANE, ITS PREPARATION AND USE IN PERFUME COMPOSITIONS AND AS AN ODORANT

Peter Meins, Mettmann, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 1, 1979, Ser. No. 16,548

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810107

Int. Cl.[2] C07D *307/93*

U.S. Cl. 252—522 R **6 Claims**

1. 13-Oxabicyclo[10.3.0]pentadecane.

2. A perfumery composition consisting essentially of from 1% to 50% by weight of the compound 13-oxabicyclo[10.3.0-]pentadecane according to claim 1 and the remainder customary constituents of perfumery compositions.

4,222,905

LAUNDRY DETERGENT COMPOSITIONS HAVING ENHANCED PARTICULATE SOIL REMOVAL PERFORMANCE

John R. Cockrell, Jr., Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 852,428, Nov. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 811,221, Jun. 29, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,341

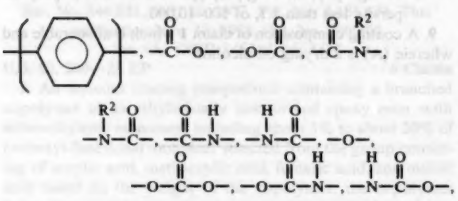
Int. Cl.[2] C11D *1/38, 3/26, 7/32*

U.S. Cl. 252—547 48 Claims

1. A detergent composition, having a pH of at least about 6.5 in the aqueous laundry solution, being substantially free of oily hydrocarbon materials, fatty acid polyglycol ether diester materials, and cationic materials containing about 13 or more ethylene oxide groups, and containing from 0 to about 20% phosphate materials, consisting essentially of about 10% to about 95% of a surfactant mixture consisting essentially of:

(a) a biodegradable nonionic surfactant having the formula $R(OC_2H_4)_nOH$, wherein R is a primary or secondary alkyl chain of from about 8 to about 22 carbon atoms and n is an average of from about 2 to about 12, having an HLB of from about 5 to about 17;

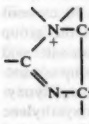
(b) a cationic surfactant, free of hydrazinium groups, having the formula $R_m^1R_x^2Y_LZ$ wherein each R^1 is an organic group containing a straight or branched alkyl or alkenyl group optionally substituted with up to three phenyl or hydroxy groups and optionally interrupted by up to four structures selected from the group consisting of



and mixtures thereof, said R^1 containing from about 8 to about 22 carbon atoms, and may additionally contain up to 12 ethylene oxide groups; m is a number from 1 to 3, with no more than one R^1 group in a molecule having a total of 16 or more carbon atoms when m is 2, or more than 12 carbon atoms when m is 3; each R^2 is an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms or a benzyl group, with no more than one R^2 in a molecule being benzyl; x is from 0 to 11, the remainder of any carbon, atom positions being filled by hydrogens; Y is selected from the group consisting of:

(1)

(2)

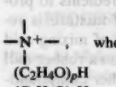


(3)

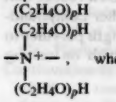
(4)

-continued

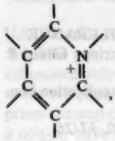
(5)



(6)



(7)



(8)

(9) mixtures thereof;

L is 1 or 2, the Y groups being separated by a moiety selected from the group consisting of R^1 and R^2 analogs having from 1 to about 22 carbon atoms and two free carbon single bonds when L is 2; Z is an anion in a number sufficient to give electrical neutrality to the molecule; said cationic surfactant being at least water-dispersible in admixture with said nonionic surfactant;

the ratio of said nonionic surfactant to said cationic surfactant being in the range of from about 1:1 to 5:1 and the balance of the composition being selected from the group consisting of: up to about 15% of an electrolyte selected from the group consisting of perborates, phosphates, polyphosphonates, carbonates and sulfates; sources of alkalinity selected from the group consisting of sodium hydroxide, triethanolamine, monoethanolamine, and sodium silicates; up to 15% of a suds suppressor selected from the group consisting of long chain fatty acids, silicone suds controlling agents, microcrystalline waxes, and alkyl phosphate esters; water; ethanol; sodium chloride; up to about 40% by weight of sodium toluene sulfonate by weight of the cationic surfactant; up to 10% by weight of sodium linear alkyl benzene sulfonate by weight of the cationic surfactant; and mixtures thereof.

4,222,906

PROCESSING GREEN STRENGTH POLYMERS

George J. Briggs, and Yung-Kang Wei, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 27, 1978, Ser. No. 900,480

Claims priority, application Canada, Oct. 27, 1977, 289716

Int. Cl.[2] C08L *7/00, 9/06, 9/00*

U.S. Cl. 260—5 8 Claims

1. An improved method for processing synthetic green strength polymers in admixture with other polymer, said other polymer being one or more of other synthetic polymers and natural rubber, said other synthetic polymers being one or more of styrene-butadiene polymers, polybutadiene and cis-1,4-polyisoprene, said synthetic green strength polymer being a styrene-butadiene polymer containing bound tertiary amine groups which have been reacted with a halogen compound to form quaternary ammonium salts, the amount of said synthetic green strength polymer being from 15 to 35 parts by weight and the amount of said other polymer being from 65 to 85 parts by weight for a total amount of polymers of 100 parts by weight, the improvement being that in a first stage of mixing said other polymer is mixed in an internal rotary mixer with carbon black and optionally one or more of oil and other

compounding additives except cure active ingredients to produce an essentially uniform mixture and said mixture is removed from the mixer, and in a second stage of mixing said mixture is mixed in an internal rotary mixer or on a rubber mill with the cure active ingredients, optionally other compounding additives and with said synthetic green strength polymer to produce an essentially uniform compound which on resting develops green strength.

4,222,907

INDUCTION OF IMMUNOLOGICAL TOLERANCE

David H. Katz, La Jolla, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Division of Ser. No. 764,586, Feb. 3, 1977. This application Sep. 25, 1978, Ser. No. 945,700

Int. Cl.[2] C08L *89/00, 77/04;* **A61K** *39/00, 37/26*

U.S. Cl. 260—6 **4 Claims**

1. A therapeutic immunosuppressive agent capable of inducing specific immunological tolerance to an antigen by suppression of antibody response, comprising a conjugate of D-glutamic acid:D-lysine copolymer and the antigen ragweed antigen E.

4,222,908

THIXOTROPIC NAIL ENAMEL

Toshihide Ikeda; Toshiaki Kobayashi, both of Yokohama; Motokiyo Nakano, Sagamihara, and Chiaki Tanaka, Kawasaki, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,242

Claims priority, application Japan, Jun. 8, 1978, 53/69087

Int. Cl.[2] A61K *7/043;* **C08L** *1/18*

U.S. Cl. 260—16 **3 Claims**

1. A thixotropic nail enamel comprising dispersed therein,

(1) as a gelling agent, a gel composition containing:

(i) 10 through 30% by weight of a chip composition which is prepared by mixing, under heating and compression, a mixture of

(A) 25 through 70% by weight of organically modified montmorillonite clay,

(B) 5 through 70% by weight of nitrocellulose, and

(C) 5 through 30% by weight of at least one substance selected from the group consisting of compounds having a general formula:

$HO(RO)_mH$, wherein R is C_2H_4 and C_3H_6 and m is an integer of 3 through 90;

$R'O(RO)_nH$, wherein R is C_2H_4 and C_3H_6, R' is an alkyl group having 4 through 20 carbon atoms and n is an integer of 1 through 50; and

esters of dicarboxylic acids having 4 through 10 carbon atoms with aliphatic lower alcohols having 1 through 4 carbon atoms; and

(ii) 70 through 90% by weight of an organic mixed solvent,

(2) at least one non-aromatic solvent and;

(3) as a film forming agent a synthetic gel resin and nitrocellulose.

4,222,909

COATING COMPOSITIONS COMPRISING ISOCYANATE-FUNCTIONAL POLYMERS CONTAINING A TERMINAL THIOALKYL GROUP

Darryl W. Brixius, Allentown, Pa., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 819,121, Jul. 26, 1977, abandoned. This application Jun. 20, 1978, Ser. No. 917,283

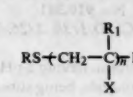
Int. Cl.[2] C08L *75/02, 91/00*

U.S. Cl. 260—18 TN **12 Claims**

1. A coating composition consisting essentially of

(A) a polymeric or a low molecular weight polyfunctional material containing a functional group complementary to an isocyanate functionality selected from the group consisting of hydroxyl, amino, and carboxyl; and

(B) a crosslinking agent which is an isocyanate-functional polymer containing at least 10%, by weight of the polymer, of copolymerized isocyanatoalkyl acrylate or isocyanatoalkyl methacrylate, wherein at least 10% by number of the polymer molecules have the following structure:



where

R is alkyl or aryl;

R_1 is hydrogen or methyl;

X is a COO—A—NCO or a mixture of COO—A—NCO and at least one of phenyl, $COOR_2$,

Cl, H; where

A is an alkylene group having 2–6 carbon atoms, and

R_2 is an alkyl group having 1–18 carbon atoms;

and n is 2–400 so that the polymer has a number average molecular weight, determined by gel permeation chromatography, utilizing polystyrene standards of polydispersity less than 1.1, of 500–10,000.

9. A coating composition of claim 1 which is air-curable and wherein (A) is a drying oil alcohol.

4,222,910

FIRE-RETARDANT POLYCARBONATE COMPOSITION

Toshimasa Tokuda, Iyo, Japan, assignor to Teijin Chemicals, Ltd., Tokyo, Japan

Filed Nov. 7, 1978, Ser. No. 958,487

Claims priority, application Japan, Nov. 10, 1977, 52/134107; Dec. 21, 1977, 52/152969; Jan. 19, 1978, 53/3749; Aug. 16, 1978, 53/99017; Aug. 16, 1978, 53/99018

Int. Cl.[2] C08K *5/41*

U.S. Cl. 260—18 TN **9 Claims**

1. A fire retardant composition comprising

(1) a polycarbonate produced by the reaction of a dihydric phenol with phosgene or a carbonic acid diester, and

(2) as a fire retardant, a metallic salt of a sulfuric ester of at least one alcohol selected from the group consisting of

(a) a monohydric alcohol having from 1 to 30 carbons, and

(b) a polyhydric alcohol having from 2 to 40 carbons wherein said metallic salt is selected from the group consisting of a sodium salt and a potassium salt; said monohydric alcohol is selected from the group consisting of an unsubstituted hydrocarbyl alkanol, a polyoxyethylene alkyl ether alcohol, and a polyoxyethylene alkylphenyl ether alcohol; and said polyhydric alcohol is selected from the group consisting of an unsubstituted hydrocarbyl alkanol having 2 to 4 hydroxyl groups, ethylene glycol monolaurate, propylene glycol monostearate, glycerol monolaurate, glycerol monopalmitate, glycerol monostearate and glycerol 1,3-bis(s-ethylhexyl)ether.

4,222,911

POLYESTER DIOL EXTENDED URALKYD RESIN AND COATING COMPOSITIONS CONTAINING THE SAME

Roger M. Christenson, and J. Alden Erikson, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 7, 1978, Ser. No. 931,632
Int. Cl.[2] C09D *3/52, 3/66, 3/72*
U.S. Cl. 260—22 TN 23 Claims

1. A polyester diol extended, ungelled, isocyanate-free uralkyd resin comprising the reaction product of

a. from about 60 to about 94 percent by weight of oil modified alkyd resin having an oil length of from about 30 to about 65 percent;

b. from about 3 to about 20 percent by weight of essentially nitrogen-free polyester diol having a number average molecular weight in the range of from about 800 to about 4000; and

c. from about 3 to about 20 percent by weight of diisocyanate.

4,222,912

LOW TEMPERATURE CURING EPOXY ESTER COPOLYMERS

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 715,382, Aug. 18, 1976, abandoned, and Ser. No. 749,968, Dec. 13, 1976, abandoned, and Ser. No. 844,021, Oct. 21, 1977, Pat. No. 4,151,131. This application Nov. 13, 1978, Ser. No. 960,309
Int. Cl.[2] C09D *3/52, 3/56, 3/58*
U.S. Cl. 260—23 EP 6 Claims

1. An aqueous coating composition containing a branched copolymer of an ethylenically unsaturated epoxy ester with monoethylenic monomers including about 3% to about 20% of carboxyl-functional monomer selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, and maleic acid based on the weight of the copolymer, the copolymer being dispersed in the aqueous composition with the aid of a volatile base, an aminoplast or phenoplast resin curing agent, and a water soluble polyol formed by ethoxylation of a bisphenol.

4,222,913

STRETCH PALLET WRAP FILM MATERIALS

Barry A. Cooper, Wayzata, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 883,411, Mar. 6, 1978, abandoned. This application Nov. 16, 1978, Ser. No. 961,293
Int. Cl.[2] C08L *23/16*
U.S. Cl. 260—23 AR 22 Claims

1. A composition suitable for processing into a stretch wrap film comprising from approximately 79% to 98% by weight of a high molecular weight ethylene-vinyl acetate copolymer, from approximately 1% to 18% by weight of a polypropylene copolymer and from approximately 0.3% to 5% by weight of a tackifier agent selected from the group consisting of glycerol mono fatty acids, sorbitan mono fatty acids, castor oil and epoxidized soya, said ethylene-vinyl acetate copolymer having a vinyl acetate comonomer content of between approximately 8% and 20% and a melt index of between approximately 0.1 and 2 and said polypropylene copolymer being a copolymer of approximately 94% to 99.5% propylene and approximately 0.5% to 6% ethylene and having a refractive index substantially similar to that of the ethylene-vinyl acetate copolymer.

4,222,914

PROCESS FOR FORMING A ZN SULFONATE CONTAINING ELASTOMER

Henry S. Makowski, Scotch Plains; Robert R. Klein, Berkeley Heights; Robert D. Lundberg, and Jan Bock, both of Bridgewater, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 2,022, Jan. 8, 1979, abandoned, which is a continuation of Ser. No. 855,756, Nov. 29, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 22,951
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.7 B 12 Claims

1. The process for preparing a cement of a zinc neutralized sulfonated polymer having a Brookfield viscosity at 0.6 rpm at room temperature of less than about 50,000 cps which comprises the step of neutralizing a sulfonated polymer dissolved in a non-reactive solvent with excess zinc acetate dissolved in a solvent system consisting of methanol or a mixture of methanol and water to form said zinc neutralized sulfonated polymer having about 10 to about 60 meq. of zinc sulfonate groups per 100 grams of zinc neutralized sulfonated polymer, wherein the volume % of methanol based on said non-reactive solvent is less than about 10.

4,222,915

VULCANIZABLE HALORUBBER MIXTURES

Siegfried Wolff, Bornheim-Merten, and Ewe H. Tan, Brühl, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed May 2, 1979, Ser. No. 35,234
Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819638
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.7 H 29 Claims

1. A vulcanizable rubber composition comprising at least one halogen containing rubber, at least one silicate filler in an amount of 1 to 250 parts by weight, 0.1 to 15 parts by weight magnesium oxide, lead oxide or zinc oxide, 0 to 15 parts by weight sulfur, 0 to 10 parts by weight of a higher fatty acid, benzoic acid or salicylic acid, 0 to 10 parts by weight of a vulcanization accelerator, 0 to 100 parts by weight of a plasticizer, 0 to 10 parts by weight of a stabilizer selected from the group consisting of antiagers, fatigue inhibitors, antioxidants, light protecting agents and ozone protecting agent, 0 to 150 parts by weight of carbon black and 0.1 to 20 parts by weight of an organosilane having the formula

$$X—C_mH_{2m}—SiR_n^1(OR)_{3-n}$$

where X is chlorine, bromine or iodine, m is a number from 1 to 5, R^1 is a C_1 to C_5-alkyl group, a C_5–C_8-cycloalkyl group or the phenyl group, R is a C_1 to C_8-alkyl group, a C_5 to C_8-cycloalkyl group, the phenyl group or the benzyl group and n is 0, 1 or 2, all amounts being based on 100 parts by weight of the halogen containing rubber.

4,222,916

RUBBERIZED COAL TAR PITCH EMULSION

P. Richard Hergenrother, Gibsonia, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 30, 1978, Ser. No. 955,714
Int. Cl.[3] C08L *91/00*
U.S. Cl. 260—285 AS 5 Claims

1. A protective coating composition for bituminous paving surfaces made by mixing coal tar emulsion, water in a volume amount equal to ¼ to 1½ the volume of coal tar emulsion, and sufficient butylacrylate emulsion to maintain the composition thixo-tropic.

4,222,917

PROCESS AIDS FOR HEAT CURED SILICONE RUBBER COMPOSITIONS

John S. Razzano, Watervliet; George P. De Zuba, Mechanicville, and Ned J. Reo, Clifton Park, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 847,195, Oct. 31, 1978, abandoned. This application Dec. 18, 1978, Ser. No. 970,420

Int. Cl.[2] C08L 83/04

U.S. Cl. 260—29.1 SB 15 Claims

1. A process aid which is prepared in situ in the presence of a polysiloxane gum comprising a reaction product of (a) 100 parts by weight of a cyclictrisiloxane of the formula, $(RR'Si-O)_3$ where R and R' are selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (b) at least 3 parts by weight of a hydroxy containing additive selected from the class consisting of H_2O and R^2OH where R^2 is an alkyl radical of 1 to 3 carbon atoms and (c) at least 200 parts per million of a catalyst selected from the class consisting of Li OH, NH_3, NH_4OH and R^3NH_2 where R^3 is a monovalent hydrocarbon radical.

4,222,918

AQUEOUS EMULSIONS, METHODS OF MAKING THE SAME AND IMPREGNATED ROVINGS MADE FROM THE EMULSIONS

Mark R. Zentner, Mount Prospect; Edward P. Zahora, Naperville, and Angelo F. Leo, Palatine, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 19, 1979, Ser. No. 21,942

Int. Cl.[2] C08L 63/00

U.S. Cl. 260—29.2 EP 17 Claims

1. An aqueous emulsion comprising water having emulsified therein particles of epoxy resin which is a polyepoxide containing more than one 1,2-oxirane group in compatible admixture with thermoplastic resin, and a curing agent for said epoxy resin dispersed in said emulsion, said curing agent being nonreactive with said epoxy resin in said emulsion under ambient conditions.

4,222,919

AQUEOUS ORGANIC COATINGS FOR METAL SURFACES

Patrick F. Aluotto, and Paul A. Drees, both of Cincinnati, Ohio, assignors to Inmont Corporation, New York, N.Y.

Filed Dec. 20, 1978, Ser. No. 972,116

Int. Cl.[2] C08G 63/18, 63/52; C08L 63/02, 67/00

U.S. Cl. 260—29.4 R 6 Claims

1. A water reducible polyester which is the esterification reaction product of:

(A) a resinous polyol made by reacting one mole of an epoxy resin containing two epoxide groups per molecule with two moles of a bis-phenol wherein said resinous polyol has an oxirane content of about 0% and at least 4 hydroxyls/mole;

(B) a monomeric polyol containing 2 to 4 hydroxyl groups and 2 to 8 carbon atoms; or a combination of polyols;

(C) alkenoic or alkanoic acid(s) containing 8 to 18 carbon atoms;

(D) di- or tri-functional carboxyl acids

wherein (A) on an equivalent weight basis and (B) are mixed and then reacted with (C) and the resulting product is then reacted with (D); the acid number of the final product is 20 to 80; and said polyester is soluble in water as its alkali or amine salt.

4. A coating composition for metal surfaces that provides coatings which will withstand steam processing at 250° F. for 30 minutes, said coating composition comprised essentially of an aqueous solution of

(A) 70 to 90% of an amine salt of the polyester defined by claim 1 and

(B) 10–30% of a cross-linking agent.

4,222,920

CEMENTS

Stephen Crisp, Hounslow, and Alan D. Wilson, Liphook, both of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 724,394, Sep. 17, 1976, abandoned, which is a continuation of Ser. No. 497,686, Aug. 15, 1974, Pat. No. 4,016,124. This application May 1, 1978, Ser. No. 901,786

Claims priority, application United Kingdom, Aug. 21, 1973, 39383/73

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.[2] C08K 3/40

U.S. Cl. 260—29.6 M 20 Claims

1. A poly(carboxylate) cement pack comprising as one component a water-soluble copolymer of acrylic acid and an unsaturated aliphatic carboxylic acid selected from the group consisting of methacrylic acid, aconitic acid, maleic acid, tiglic acid, fumaric acid and mesaconic acid, the mole ratio of acrylic acid to unsaturated aliphatic carboxylic acid in said copolymer being from 19:1 to 2:1, the copolymer having an average molecular weight of from 5,000 to 19,000 and as another component a fluoroaluminosilicate glass cement powder which will react with the acrylic acid copolymer in the presence of water to give a plastic mass which hardens to form a poly(carboxylate) cement.

4,222,921

POLYAMINE/EPIHALOHYDRIN REACTION PRODUCTS

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 19, 1978, Ser. No. 916,631

Int. Cl.[2] C08F 2/10

U.S. Cl. 260—29.6 H 4 Claims

1. A process for the production of an acid stabilized resin solution which process comprises

(A) polymerizing an aqueous solution of a diallylamine salt having the formula $[(CH_2{=}C(R){-}CH_2)_2NHR'^{\oplus}]_n X^{\ominus}$, wherein the R groups are the same or different and are selected from hydrogen and lower alkyl groups, R' is selected from hydrogen, alkyl and substituted alkyl groups, $X^{\ominus}$ is an anion selected from sulfate, bisulfate and nitrate in which the final pKa is less than 2 and n is an integer from 1 to 3 and is the valence of the anion; either alone or as a mixture with other copolymerizable monomers, selected from the group consisting of different diallylamines, monoethylenically unsaturated compounds containing a single vinylidene group and sulfur dioxide, in the presence of a free radical catalyst to form a polymer in which from 5 to 100% of the recurring units are derived from the diallylamine;

(B) raising the pH of the solution sufficiently to convert part or all of the monomeric and polymeric amine salt functionalities to free amine groups but not so high as to precipitate the polyamine from solution;

(C) reacting the polyamine with from about 0.5 to about 1.5 moles of an epihalohydrin per mole equivalent of secondary plus tertiary amine present in said solution, at a temperature of about 30° to about 80° C. and a pH from about 7 to about 9.5, to form a water-soluble resinous reaction product containing epoxide groups; and

(D) reacting the resinous reaction product in aqueous solution, with from about 0.3 equivalents to about 1.2 equivalents per equivalent of epihalohydrin of a water-soluble acid selected from the group consisting of hydrogen halide acids, sulfuric acid, nitric acid, phosphoric acid, formic acid and acetic acid until an acid-stabilized resin solution is obtained.

4,222,922

WARP SIZE FOR FILAMENT YARN CONSISTING ESSENTIALLY OF POLYVINYL ALCOHOL HAVING A DEGREE OF HYDROLYSIS OF 88–100%, QUATERNARY AMMONIUM SURFACTANT AND PLASTICIZER

Richard W. Rees, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 901,852, May 1, 1978, abandoned. This application Dec. 27, 1978, Ser. No. 973,624

Int. Cl.[2] C08L *29/04*

U.S. Cl. 260—29.6 BE 10 Claims

1. A composition consisting essentially of (a) about 100 parts by weight of polyvinyl alcohol having a degree of hydrolysis of from about 88 to about 100 mol % and a solution viscosity of from about 5 to about 50 mPa.s measured as a 4% aqueous solution at a temperature of 20° C., (b) from about 0.5 to about 10 parts by weight of cationic surfactant selected from the group consisting of alkyl phenoxyethoxyethyl dimethylbenzyl ammonium chlorides and alkyl cresoxyethoxyethyl dimethylbenzyl ammonium chlorides wherein the alkyl group has 2 to 12 carbon atoms, and (c) from about 4 to about 50 parts by weight of plasticizer selected from the group consisting of polyhydric alcohol having up to 3 hydroxyl groups and up to 8 carbon atoms, and urea.

4,222,923

ADHESIVE COMPOSITION AND METHOD OF USE

John Rhodes, 25 Nant Fawr Rd. Cyncoed, Cardiff, Wales, and William Douglas, 2321 Stone Dr., Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 882,752, Mar. 2, 1978, abandoned. This application Apr. 18, 1978, Ser. No. 897,389

Claims priority, application United Kingdom, Mar. 2, 1978, 9326/78

Int. Cl.[2] C08K *5/10;* C08L *27/24*

U.S. Cl. 260—31.8 DR 21 Claims

1. An adhesive composition consisting essentially of a gelled mixture of:

(1) a poly (lower alkyl) methacrylate,

(2) a physiologically compatible liquid plasticizer,

(3) an inert particulate filler, and

(4) a chlorinated rubber.

4,222,924

BLENDS OF CLAY, PROCESSING OIL AND ETHYLENE/VINYL ESTER COPOLYMERS

Frederick G. Schumacher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1978, Ser. No. 963,112

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 UA 10 Claims

1. A composition consisting essentially of (a) from about 15 to about 25% by weight of clay; (b) processing oil in an amount that the weight ratio of oil:clay is from about 1:2.5 to about 1:1; (c) from about 10 to about 40% by weight of ethylene/vinyl acetate copolymer, the ethylene content of said copolymer being from about 60 to about 90% by weight, the vinyl acetate comonomer content of said copolymer being from about 10 to about 40% by weight, said copolymer optionally containing from 0 to about 30% by wt. of additional comonomer selected from the group consisting of unsaturated mono- or dicarboxylic acids of 3 to 5 carbon atoms and esters of said unsaturated mono- or dicarboxylic acids wherein the alcohol moiety has 1 to 8 carbon atoms, carbon monoxide and sulfur dioxide, and the melt index of said copolymer being from about 0.1 to about 500; and (d) from about 10 to about 50% by weight of inert organic or filler additive.

4,222,925

VULCANIZABLE SILICON TERMINATED POLYURETHANE POLYMER COMPOSITIONS HAVING IMPROVED CURE SPEED

Earle R. Bryant, Adrian, Mich.; Gerald H. Knittel, Waterville, and Lon E. Dircks, Swanton, both of Ohio, assignors to Inmont Corporation, New York, N.Y.

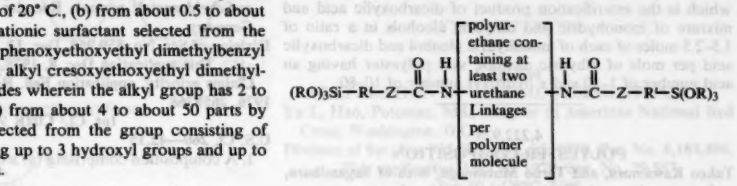
Filed Aug. 2, 1978, Ser. No. 930,309

Int. Cl.[2] C08L *75/08*

U.S. Cl. 260—37 N 6 Claims

1. In a sealant composition comprised of a prepolymer which is a blend of:

(a) a silicon terminated vulcanizable polyurethane polymer of the formula



wherein R is a lower alkyl radical of from 1 to 6 carbon atoms, R' is a divalanet bridging radical selected from the group consisting of a divalent hydrocarbon radical, and a divalent hydrocarbon ether radical, and wherein Z is a member selected from the group consisting of S and NR", where R" is H or a lower alkyl radical of from 1 to 6 carbons with

(b) a small amount of N-beta aminoethyl, gamma aminopropyl trimethoxy silane,

the improvement comprising adding, as a reinforcing filler, a high strength carbon black containing less than 0.05% of water to obtain a sealant having a viscosity as indicated by K value of less than 850, and a cure speed of at least 70 psi cleavage in three hours elapsed time.

4,222,926

FLAME-RETARDANT THERMOPLASTIC POLYESTER RESIN COMPOSITIONS

Shioji Mizuno, Osaka, and Norio Enokimoto, Izumi, both of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,349

Claims priority, application Japan, Apr. 15, 1977, 52/43347

Int. Cl.[2] C08K *3/10, 5/02, 5/03, 67/02*

U.S. Cl. 260—40 R 18 Claims

1. A flame-retarding thermoplastic polyester resin composition comprising (1) a thermoplastic polyester obtained from a terephthalic acid or an alkyl ester thereof and a glycol having 2 to 4 carbon atoms selected from the group consisting of ethylene glycol, propylene glycol and butylene glycol, (2) 2 to 30 parts by weight, as halogen, per 100 parts by weight of (1) of an organohalogen compound, (3) an inorganic flame-retarding supplementary agent, and (4) 0.5 to 30 parts by weight per 100 parts by weight of (1) of at least one polymer selected from the group consisting of a saponified polyvinyl acetate having a saponification degree of greater than 50%, an ethylene/vinyl acetate copolymer having a vinyl acetate content of greater than 50% by weight and a Monney viscosity of 10 to 80 and a saponified ethylene/vinyl acetate copolymer, and optionally (5) a reinforcing agent.

4,222,927
DISPERSIONS OF POWDERS IN UNSATURATED POLYESTERS

Hansjochen Schulz-Walz, Krefeld; Bernhard Hess, Moers; Johannes Beckers, Kempen, and Werner Klöker, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,273

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1977, 2731320

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—40 R **3 Claims**

1. A dispersion, free from copolymerizable monomers, of 10–80% by weight of powder insoluble in polyester and 90–20% by weight of α,β-ethylenically unsaturated polyester which is the esterification product of dicarboxylic acid and mixture of monohydric and dihydric alcohols in a ratio of 1.5–2.5 moles of each of monohydric alcohol and dicarboxylic acid per mole of dihydric alcohol, said polyester having an acid number of 1–50 and a hydroxyl number of 10–80.

4,222,928
POLYESTER COMPOSITION

Takeo Kawamura, and Teruo Matsunaga, both of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 7, 1978, Ser. No. 958,488

Claims priority, application Japan, Nov. 9, 1977, 52-133583; Dec. 15, 1977, 52-149905; May 22, 1978, 53-59890

Int. Cl.[2] C08L *63/00, 67/00*

U.S. Cl. 260—40 R **9 Claims**

1. A composition comprising (A) 100 parts by weight of an aromatic polyester, (B) 5 to 150 parts by weight of flat glass flakes up to one-half of which may be replaced by a powdery inorganic solid, and (C) 0.01 to 10% by weight, based on the total weight of (A) and (B), of an epoxy compound containing two terminal epoxy groups selected from the group consisting of (i) diglycidyl polyether (mono- to deca-mers) obtained by the reaction of 2,2-bis(4-hydroxyphenyl) propane (bisphenol A) with epichlorohydrin and (ii) diglycidyl ether obtained by the reaction of a glycol with epichlorohydrin.

4,222,929
LOW-SHRINK IN-MOLD COATING

Henry Shanoski, Akron, and Donald F. Reichenbach, Massillon, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 958,771, Nov. 8, 1978, Pat. No. 4,189,517. This application Apr. 23, 1979, Ser. No. 32,049

Int. Cl.[3] C08K *3/22, 3/26, 3/34, 3/36*

U.S. Cl. 260—40 TN **6 Claims**

1. A thermosetting composition comprising essentially:

(a) an unsaturated aliphatic polyester fumarate diol having an average molecular weight of from about 1,500 to 4,500 and from about 8 to 30 internal aliphatic carbon-to-carbon double bonds,

(b) a saturated aliphatic polyester diol flexibilizer having an average molecular weight of from about 1,500 to 3,000, (b) being present in a minor molar amount as compared to (a),

(c) an aliphatic crosslinking polyol having from 3 to 6 hydroxyl groups and an average molecular weight of from about 92 to 1,000,

(d) a diisocyanate selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, 4,4'-diphenyl methane diisocyanate, 4,4'-dicyclohexyl methane diisocyanate, polymeric forms of TDI, MDI and hydrogenated MDI, xylene diisocyanate, isophorone diisocyanate and hexamethylene diisocyanate and mixtures thereof, said diisocyanate being present in an amount by weight sufficient to provide from about 50 to 120% of the stoichiometric amount of —NCO groups required to react with all of the active hydrogen atoms in said composition, and

(e) an ethylenically unsaturated monomer selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene, methyl methacrylate, acrylamide, acrylonitrile, methyl acrylate and mixtures thereof, said monomer being present in an amount sufficient to copolymerize with and crosslink said unsaturated polyester, in admixture with

(f) from about 2 to 20 parts by weight of polyvinyl acetate per 100 parts by weight of said total composition.

4,222,930
SULFUR AND PHOSPHORUS CONTAINING ORGANOSILICON COMPOUNDS AND PROCESS FOR THEIR PRODUCTION AND USE

Hans-Dieter Pletka, Mobile, Ala., and Gerd Zezulka, Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 859,968, Dec. 12, 1977, Pat. No. 4,152,347. This application Dec. 8, 1978, Ser. No. 967,577

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658368

Int. Cl.[2] C08K *9/06*

U.S. Cl. 260—42.15 **17 Claims**

1. A composition comprising (a) a compound of the formula

$$[R_n^1 (R^2O)_{3-n}—Si—Alk—S—]_xZ$$

in which Z has the meanings =PO, =PS, ≡P, =PR, —P(R)$_2$, —P(OR)$_2$, =P(OR), —PO(OR)$_2$, —PS(OR)$_2$, =PO(OR) or =PS(OR) where R is an alkyl group containing from 1 to 5 carbon atoms, the phenyl radical, the nitrophenyl radical;

Alk is an alkylene group containing from 2 to 4 carbon atoms;

R^1 is an alkyl group containing from 1 to 5 carbon atoms, the benzyl group or the phenyl group;

R^2 represents an alkyl group containing from 1 to 5 carbon atoms, a cycloalkyl group containing from 5 to 8 carbon atoms, the phenyl group, the benzyl group or the 2-methoxy ethyl group;

n=0, 1 or 2; and

x=3, 2 or 1.

(b) a vulcanizable rubber and (c) a siliceous filler.

4,222,931
STABILIZERS FOR SYNTHETIC POLYMERS COMPRISING 2,2,6,6-TETRAMETHYL-4-PIPERIDYL ETHER ALCOHOL OR ETHER, PHOSPHONIC ACID ESTER AND PHENOLIC ANTIOXIDANT

Motonobu Minagawa, Kosigaya; Yutaka Nakahara, Iwatsuki; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Dec. 8, 1977, Ser. No. 858,773

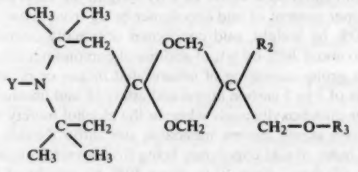
Claims priority, application Japan, Dec. 24, 1976, 51-155972

Int. Cl.[2] C08K *5/35, 5/53;* **C09K** *15/20, 15/32*

U.S. Cl. 260—45.8 NZ **27 Claims**

1. A stabilizer composition for organic polymeric materials comprising

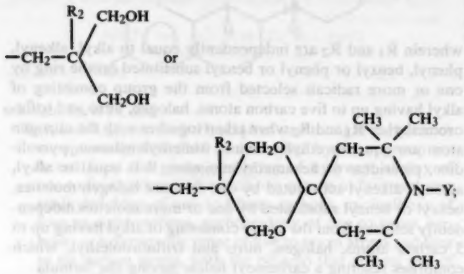
(a) a 2,2,6,6-tetramethyl-4-piperidyl ether alcohol or ether in an amount from about 90 to about 35 parts by weight and having the general formula:



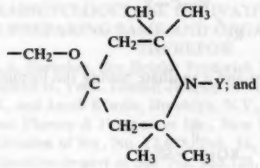
wherein

R_2 is lower alkyl or hydroxyalkyl having from one to six carbon atoms;

R_3 is a hydrogen atom, provided R_2 is hydroxyalkyl;



R_2 and R_3 may be taken together to form

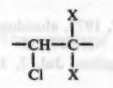


Y is selected from the group consisting of hydrogen and O;

(b) a phosphonic acid ester in an amount of from about 10 to about 35 parts by weight; and

(c) a phenolic antioxidant in an amount of from about 10 to about 35 parts by weight.

18. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group



and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and an amount to enhance the resistance to deterioration of the resin of a stabilizer composition in accordance with claim **1**.

4,222,932

POLYARYLENE ARYLATE COMPOSITIONS

Leo E. Rademacher, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 29, 1979, Ser. No. 24,926

Int. Cl.[2] **C08K** *5/16*

U.S. Cl. 260—45.9 KB **18 Claims**

1. A stabilizer composition for a polyarylene ester of an aromatic dicarboxylic acid, comprising a synergistically effective mixture of an aromatic isocyanate of molecular weight less than about 1000 and an aliphatic phosphite of boiling point greater than about 300° C. and molecular weight less than about 2000, wherein the ratio of phosphite to isocyanate is in the range of from about 0.01 to about 10 equivalents said polyarylene ester being the condensation product of at least one C_8–C_{25} aromatic dicarboxylic acid and at least one C_6–C_{25} diphenol.

4,222,933

TREATMENT OF ROSIN

John A. Alford, Hanahan, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,906

Int. Cl.[2] **C09F** *1/04*

U.S. Cl. 260—107 **8 Claims**

1. A process for treating rosin which comprises;

(a) treating said rosin with from 0.001% to 1.0% boric acid and with zinc in an amount from 0.01% to about 2.0% by weight of said rosin at a temperature from about 180° C. to 250° C., and

(b) distilling the thus treated rosin to obtain rosin acids having improved color and color stability.

4,222,934

PREPARATION OF ALBUMIN USING ETHANOL

Yu L. Hao, Potomac, Md., assignor to American National Red Cross, Washington, D.C.

Division of Ser. No. 935,922, Aug. 23, 1978, Pat. No. 4,164,496. This application Apr. 12, 1979, Ser. No. 29,557

Int. Cl.[2] **C07G** *7/00*

U.S. Cl. 260—122 **1 Claim**

1. A method for the preparation of albumin comprising:

(a) adjusting the pH of plasma in liquid form to about 6.7;

(b) heating the plasma at a temperature of approximately 60° C. for about 1½ hours;

(c) adjusting the pH of the plasma to about 5.7;

(d) precipitating impurities from the plasma by the addition of ethanol in an amount sufficient to give a final concentration of about 40 to 44% in the plasma along with cooling of the plasma to about −5° C., with the albumin remaining in the supernatant; and

(e) precipitating albumin from said supernatant at a pH of about 4.8.

4,222,935

PROCESS FOR THE MANUFACTURE OF AROMATIC NITRILES

Antony Greenall; Raymond Price, and Peter M. Quan, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 27, 1979, Ser. No. 62,224

Claims priority, application United Kingdom, Aug. 7, 1978, 32469/78

Int. Cl.[2] **C07C** *120/00*; **C09B** *43/00*

U.S. Cl. 260—205 **9 Claims**

1. A process for the manufacture of aromatic nitriles which comprises reacting an aromatic halide which is a chlorine, bromine or iodine compound with formamide and the anhydride of a monocarboxylic acid in the presence of a copper catalyst and an acid-binding agent.

4,222,936

3-AZABICYCLO(3.1.0)HEXANE-2-CARBONITRILE

Ronald F. Mason, Westwell nr. Ashford, and Barry R. J. Devlin, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 2, 1979, Ser. No. 26,150

Claims priority, application United Kingdom, Apr. 20, 1978, 15677/78

Int. Cl.[2] **C07D** *201/52*

U.S. Cl. 260—326.62 **1 Claim**

1. 3-azabicyclo(3.1.0)hexane-2-carbonitrile.

4,222,937

TOTAL SYNTHESIS OF THE UTERO-EVACUANT SUBSTANCE D,L-ZOAPATANOL

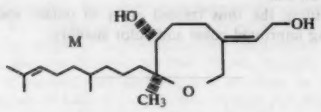
Robert H. K. Chen, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corp., Raritan, N.J.

Division of Ser. No. 920,432, Jun. 29, 1978, Pat. No. 4,177,194. This application Mar. 23, 1979, Ser. No. 23,491

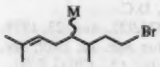
Int. Cl.[2] C07D *313/04, 309/12*

U.S. Cl. 260—333 **3 Claims**

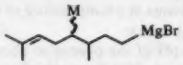
1. The process for the preparation of a compound of the formula



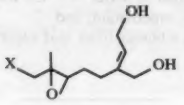
which comprises reacting a compound of the formula



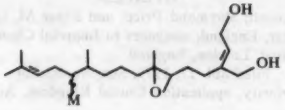
with magnesium to produce a compound of the formula



reacting the product with a compound of the formula



in an inert organic solvent at a temperature between about −20° and 0° C. to produce a compound of the formula



and reacting the product with a Lewis acid or a protic acid in an inert organic solvent at a temperature between about 0° and 30° C., wherein M is an tetrahydropyran-2-yloxy group or an 1-ethoxyethoxy group and X is tosyl, mesyl, brosyl, chloro, bromo, and iodo.

4,222,938

PREPARATION OF THIOLCARBAMATES

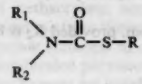
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 29, 1978, Ser. No. 947,135

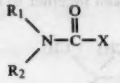
Int. Cl.[2] C07D *205/00, 203/06;* C07C *155/02;* C07D *207/04*

U.S. Cl. 260—239 A **5 Claims**

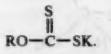
1. A process for the preparation of thiolcarbamates having the formula:



wherein R_1 and R_2 are independently equal to alkyl, alkenyl, phenyl, benzyl or phenyl or benzyl substituted on the ring by one or more radicals selected from the group consisting of alkyl having up to five carbon atoms, halogen, nitro and trifluoromethyl or R_1 and R_2 when taken together with the nitrogen atom are equal to ethyleneimine, trimethyleneimine, pyrrolidine, piperidine or hexamethyleneimine; R is equal to alkyl, alkenyl, alkenyl substituted by one or more halogen moieties, benzyl or benzyl substituted by one or more moieties independently selected from the group consisting of alkyl having up to 5 carbon atoms, halogen, nitro and trifluoromethyl, which comprises reacting a carbamoyl halide having the formula



wherein X is a halogen and a xanthate having the formula



4,222,939

PROCESS FOR PREPARING SOLID SODIUM AMOXYCILLIN

Dennis E. Clark, Basking Ridge, and Robert C. Blyth, North Plainfield, both of N.J., assignors to Beecham Group Limited, Great Britain

Continuation of Ser. No. 810,500, Jun. 27, 1977, abandoned. This application Aug. 29, 1978, Ser. No. 937,735

Claims priority, application United Kingdom, Jul. 7, 1976, 28179/76

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **19 Claims**

1. A process for the preparation of solid sodium amoxycillin which comprises freeze drying a solution of sodium amoxycillin in a solvent system containing water and at least one secondary or tertiary C_4 or C_5 carbinol, which is at least 5% w/v soluble in water at 25° C.

4,222,940

CYCLIZATION SUBSTRATES, CYCLIZATION PROCESS AND RELATED 11β-AXIALLY-SUBSTITUTED STEROIDS

Filippus J. Zeelen, Heesch, and Arnoldus I. A. Broess, Rijen, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

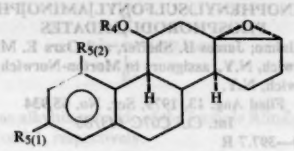
Filed Oct. 23, 1978, Ser. No. 953,790

Claims priority, application Netherlands, Oct. 25, 1977, 7711667

Int. Cl.[3] C07J *5/00;* C07C *5/09*

U.S. Cl. 260—239.55 R **28 Claims**

28. A compound of the formula:



wherein R_4 is H, and

$R_{5(1)}$ and $R_{5(2)}$ are each H, alkyl of one to eight carbons, or an optionally esterified or etherified hydroxy group selected from the group consisting of hydroxy, alkoxy of one to four carbons, alkoxyalkoxy of two to four carbons, trialkylsilyloxy of one to fifteen carbons, cycloalkoxy of four to eight carbons, carboacyloxy of one to seven carbons, or heterocyclic ether of five to seven atoms and four to six carbon atoms, with the proviso that at least one of $R_{5(1)}$ and $R_{5(2)}$ is H.

4,222,941

2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREFOR

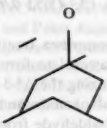
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 12,695, Feb. 16, 1979, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978. This application Jun. 15, 1979, Ser. No. 48,752

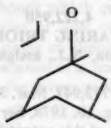
Int. Cl.[3] C07D *309/04*

U.S. Cl. 260—345.1 **7 Claims**

1. The compound having the structure:



7. The compound having the structure:



4,222,942

ISOLATION OF ORGANIC ACIDS

Peter J. O'Hanlon, Redhill; Maurice C. Woodford, Billingshurst, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

Filed Sep. 29, 1978, Ser. No. 946,873

Claims priority, application United Kingdom, Sep. 30, 1977, 40678/77

Int. Cl.[2] C07D *309/06*

U.S. Cl. 260—345.8 R **9 Claims**

1. Process for the isolation of pseudomonic acid from a crude preparation thereof which comprises extracting a solution of said crude preparation in a water immiscible organic solvent with an aqueous media having a pH value of 7 to 9 so as to obtain an aqueous solution of the acidic components of the crude preparation substantially free of any neutral components, lowering the pH of said aqueous solution to a value of from 4.0 to 5.0, and extracting the pH adjusted aqueous solution either (a) with a polar water immiscible organic solvent and thereafter adding a diluent which is sufficiently non-polar to reduce the polarity of, but is miscible with, said polar organic solvent so as to effect crystallization of said pseudomonic acid or (b) with a dialkyl ether wherein each alkyl has 1 to 6 carbon atoms and allowing said pseudomonic acid to crystallize therefrom; and thereafter isolating said pseudomonic acid.

4,222,943

PROCESS FOR THE PREPARATION OF ESTERS OF 5-FORMYL-3-METHYL-2,4-PENTADIEN-1-OL

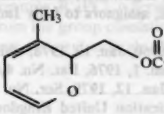
Gary L. Olson, Westfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 772,711, Feb. 28, 1977, Pat. No. 4,152,520, which is a division of Ser. No. 594,386, Jul. 9, 1975, abandoned. This application Feb. 5, 1979, Ser. No. 9,218

Int. Cl.[2] C07D *309/32*

U.S. Cl. 260—345.8 R **2 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl.

4,222,944

HALO-3-DIBENZOFURAN ALKANONITRILES

Leo Berger, Montclair, and Robert A. Schmidt, Wallington, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

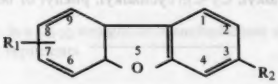
Division of Ser. No. 747,153, Dec. 3, 1976, abandoned, which is a division of Ser. No. 548,658, Feb. 10, 1975, Pat. No. 4,022,805, which is a continuation-in-part of Ser. No. 448,853, Mar. 7, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,869

Int. Cl.[3] C07D *307/91*

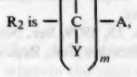
U.S. Cl. 260—346.71 **2 Claims**

1. (amended) A compound of the formula

I



wherein R_1 is halogen; and

R_2 is 

wherein A is cyano, X and Y, independently, are hydrogen or lower alkyl, and m is 1 to 7;
when X and Y are different, its enantiomers.

4,222,945

PRODUCTION OF MALEIC ANHYDRIDE

Raymond Higgins, and Graham J. Hutchings, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 25, 1979, Ser. No. 6,554

Claims priority, application United Kingdom, Jan. 30, 1978, 3686/78; Feb. 6, 1978, 4657/78; Nov. 20, 1978, 45298/78

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **11 Claims**

1. A process for producing maleic anhydride comprising

oxidising 10 to 50% of a linear C_4 hydrocarbon by contacting it with oxygen, the hydrocarbon concentration being at least 10 molar % and being higher than the flammable limit; the oxygen concentration being greater than 13 molar % of the total material fed to the reaction and the concentration of any inert gas present being less than 70 molar % of the total material fed to the reaction; said oxidation conducted in the presence of a catalyst consisting essentially of a phosphorus/-vanadium mixed oxide, the atomic ratio of the vanadium:phosphorus being in the range of about 0.5:1 to about 2:1, the surface area of the catalyst being at least 10 square meters per gram.

4,222,946

ACYLAMINO FURAN DERIVATIVES

Delme Evans, Chalfont St. Peter; Michael R. J. Jolley, Camberley; William J. Ross, Lightwater, and Brian P. Swann, Camberley, all of England, assignors to Lilly Industries, Limited, London, England

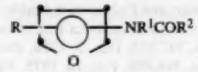
Division of Ser. No. 870,960, Jan. 19, 1978, which is a division of Ser. No. 691,961, Jun. 1, 1976, Pat. No. 4,082,771. This application Jan. 12, 1979, Ser. No. 2,835

Claims priority, application United Kingdom, Jun. 5, 1975, 24223/75

Int. Cl.[2] C07D *307/66*

U.S. Cl. 260—347.3 **9 Claims**

1. A compound of the formula:



wherein

R is hydrogen, C_1–C_4 alkyl or phenyl optionally substituted by halogen, trifluoromethyl or C_1–C_3 alkoxy;

R^1 is C_1–C_7 alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl or benzyl optionally substituted by halogen or nitro; and

R^2 is C_1–C_7 alkyl, C_3–C_{10} cycloalkyl, phenyl or benzyl.

4,222,947

ANTHRACHINONE DYESTUFFS

Volker Hederich, Cologne; Winfried Kruckenberg, and Karl H. Schündehütte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

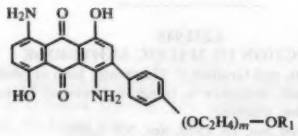
Filed Feb. 15, 1979, Ser. No. 12,291

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806733

Int. Cl.[2] C07C *97/26*; C09B *1/514*

U.S. Cl. 260—380 **4 Claims**

1. Dyestuffs of the formula



in which

R_1 represents a C_1–C_6-alkyl radical which is optionally substituted by a C_1–C_4-alkoxy group and

m represents a number between 3 and 5.

4,222,948

[[(4-AMINOPHENYL)SULFONYL]AMINO]PHENYL PHOSPHORODIAMIDATES

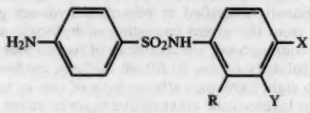
Robert J. Alaimo; James B. Sheffer, and Ozra E. Millner, Jr., all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Aug. 13, 1979, Ser. No. 65,934

Int. Cl.[2] C07C *143/80*

U.S. Cl. 260—397.7 R **4 Claims**

1. A compound of the formula:



wherein X and Y are dissimilar substituents selected from hydrogen and

and R is hydrogen or methyl.

4,222,949

PROCESS FOR SEPARATING STIGMASTEROL-DERIVED PRODUCTS (II)

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,033

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.25 **5 Claims**

1. A process which comprises treating a crude mixture of sterols containing stigmasterol to form the Δ^4-3-keto derivatives of said sterols, ozonizing the Δ^4-3-keto sterol derivatives, reducing the phytosterol ozonide and thereafter recovering 3-keto-dinor-4-cholen-22-aldehyde from the reaction mixture.

4,222,950

METHOD FOR PREPARING TRIORGANOTIN HALIDE

Melvin H. Gitlitz, Edison, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

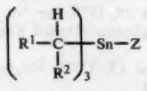
Continuation of Ser. No. 773,941, Mar. 3, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,448

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] C07F *7/22*

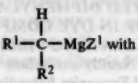
U.S. Cl. 260—429.7 **5 Claims**

1. A method for preparing a triorganotin halide of the general formula

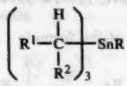


wherein R^1 and R^2 are individually selected from the group consisting of linear and branched-chain alkyl containing from 1 to 4 carbon atoms with the proviso that the total number of carbon atoms in R^1 and R^2 is from 5 to 7 and Z is chlorine, bromine or iodine, said method comprising the following steps:

a. reacting a sec-alkylmagnesium halide of of the general formula



with an alkyltin trihalide of the formula $RSnZ_3^2$ in a molar ratio of 3:1, respectively,
to form a tetraorganotin compound



wherein R represents a linear alkyl containing from 1 to 8 carbon atoms and Z^1 and Z^2 are each individually selected from the group consisting of chlorine, bromine and iodine;

b. reacting said tetraorganotin compound with an equimolar amount of a stannic halide of the general formula SnZ_4^3 wherein Z^3 is selected from the same group as Z, the reaction of said tetraorganotin compound being conducted under anhydrous conditions and in a hydrocarbon solvent at a temperature of from −25° to 80° C.; and

c. extracting the resultant reaction mixture containing said triorganotin halide with water or an aqueous solution of a mineral acid to remove the alkyltin trihalide, $RSnZ_3^3$, formed as a by-product of the reaction; and

d. removing said hydrocarbon solvent and isolating said triorganotin halide.

4,222,951

ADDITION OF SI-BONDED HYDROGEN TO AN ALIPHATIC MULTIPLE BOND

Gerhard Kreis, Munich, and Peter August, Seevetal, both of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 11,966

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809875

Int. Cl.² C07F *7/08*

U.S. Cl. 556—478 **8 Claims**

1. A process for preparing organosilicon compounds containing carbon-silicon bonds which comprises reacting a silicon compound containing at least one Si-bonded hydrogen with a compound containing an aliphatic multiple bond in the presence of a catalytic amount of at least one halogen platinum complex selected from the group consisting of

A_2PtX_2, $C_3H_6PtB_2X_2$

and mixtures thereof, in which A represents a pyridine ring containing 1 or 2 alkyl radicals having from 1 to 3 carbon atoms, B is selected from the group consisting of 5- or 6-membered heterocyclic radicals and linked 5- or 6-membered heterocyclic radicals containing 1 or 2 heteroatoms and X represents chlorine.

4,222,952

SILOXANE BOND REARRANGEMENT EFFECTED BY SOLID PERFLUORINATED POLYMERS CONTAINING PENDANT SULFONIC ACID GROUPS

Steven C. Vick, Stormville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,492

Int. Cl.² C08F *8/36, 8/40;* B01J *27/12*

U.S. Cl. 556—462 **18 Claims**

1. A process for siloxane bond rearrangement which comprises treating, at a temperature of from about 70° C. to about 180° C., an organosiloxane composition with a solid perfluorinated polymer containing pendant sulfonic acid groups.

4,222,953

METHOD OF PREPARING ORGANOSILOXANES AND METHYLCHLORIDE

Louis G. Mahone, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 6, 1979, Ser. No. 64,153

Int. Cl.² C07F *7/08*

U.S. Cl. 260—466 **12 Claims**

1. A method for reacting a chlorosilane of the formula (1) R_nSiCl_{4-n} with (2) methanol to produce siloxanes of the formula $R_nSiO_{4-n/2}$ and methylchloride in which R is an alkyl radical of 1 to 4 carbon atoms and n has an average value from 1.95 to 3, consisting essentially of heating a mixture of (1) and (2) in contact with a tetraorganophosphonium chloride salt catalyst of the formula R'_4PCl wherein each R' is independently selected from the group consisting of alkyl radicals of 1 to 10 carbon atoms and aryl radicals of 6 to 10 carbon atoms.

4,222,954

IODOPHORE COMPOUNDS

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 873,025, Jan. 27, 1978, abandoned. This application Nov. 2, 1978, Ser. No. 957,257

Int. Cl.² C07C *69/00;* C10M *3/24;* A61K *33/18, 31/265*

U.S. Cl. 260—463 **4 Claims**

1. An iodophore compound prepared by reaction of iodine with a polyether polycarbonate formed by reaction of a lower alkylene oxide, carbon dioxide and an organic hydroxy initiator compound falling within the following structural formula:

R_1-(-OCH_2CH_2-)$_z$OH

where R_1 is a C_{6-22} straight or branched chain alkyl or alkenyl group or represents

where R is a C_1–C_{22} alkyl group, n is an integer of 1–3, and z is an integer of 2–20 wherein the ratio of alkylene oxide plus carbon dioxide to initiator ranges from 1:1 to 30:1, and the ratio of alkylene oxide to carbon dioxide ranges from 8:1 to 1:1.

4,222,955

3,5-DIAMINO-4-TERT.-ALKYLBENZONITRILES

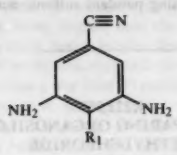
Daniel A. Chung, North Canton, and John P. Lawrence, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 13,697, Feb. 21, 1979. This application Aug. 31, 1979, Ser. No. 71,529

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **3 Claims**

1. A 3,5-diamino-4-tert.-alkylbenzonitrile of the formula



(II)

wherein R_1 is selected from tertiary saturated hydrocarbon radicals containing 4–6 carbon atoms.

4,222,956

PROCESS FOR THE PRODUCTION OF CYANOCARBOXYLIC ACIDS

Axel Kleemann; Peter Schalke, and Detlef Arnoldi, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,133

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811702

Int. Cl.[3] C07C *120/00, 121/407*

U.S. Cl. 260—465.4 18 Claims

1. A process for the production of a cyanoalkanoic acid comprising reacting a haloalkanoic acid in the presence of an alkaline acting material with a cyanohydrin of the formula

where R_1 is hydrogen or alkyl of 1 to 8 carbon atoms and R_2 is alkyl of 1 to 8 carbon atoms in the presence of water.

4,222,957

PROCESS OF PURIFYING ETHER SULFONATES

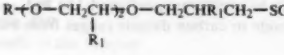
Lewis W. Watts, Jr.; Walter H. Brader, Jr.; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 791,751, Apr. 28, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,616

Int. Cl.[2] C07C *143/38*

U.S. Cl. 260—512 R 5 Claims

1. A method of purifying aqueous solutions of ether sulfonates which contain at least bisulfite impurity, said ether sulfonates having the following structural formula:



where R is a radical selected from the group consisting of C_1–C_{30} alkyl, C_2–C_{30} alkenyl, C_1–C_{30} substituted alkyl, C_2–C_{30} substituted alkenyl, alkaryl containing one or more C_1–C_{18} alkyl groups substituted on said aryl group and aralkyl containing 7–28 carbon atoms, R_1 is H or CH_3, z is an integer of 1–40 and A is an alkali metal cation, which comprises the steps of contacting said aqueous solution with ethylene oxide or propylene oxide at a temperature ranging from about room temperature up to about 250° C. for a time ranging from about ¼ to about 24 hours and separating out a resultant top aqueous layer of purified ether sulfonate from a bottom aqueous layer containing said impurity.

4,222,958

4,4'-DISUBSTITUTED DIPHENYLAMINES AND THE USE THEREOF IN DYE COMPOSITION FOR KERATINIC FIBERS

Gregoire Kalopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 551,662, Feb. 21, 1975, Pat. No. 4,054,147.

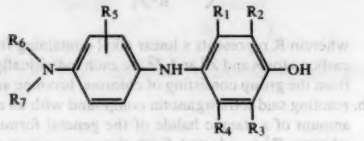
This application May 17, 1977, Ser. No. 797,807

Claims priority, application Luxembourg, Feb. 22, 1974, 69456

Int. Cl.[2] C07C *127/19, 91/40, 103/127*

U.S. Cl. 260—559 D 22 Claims

1. A diphenylamine of the formula



wherein

R_1 represents a member selected from the group consisting of lower alkyl, lower alkoxy, amino, acetylamino, lower carbamylalkylamino, lower hydroxyalkylamino and ureido;

R_4 represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, amino, acetylamino, carbamylalkylamino, lower hydroxyalkylamino and ureido;

R_2 and R_3 each independently represent a member selected from the group consisting of hydrogen, lower alkyl, acetylamino, halogen and lower alkoxy;

R_5 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy;

R_6 represents lower hydroxyalkyl; and

R_7 represents lower hydroxyalkyl, with the proviso that when one of R_1 to R_4 is lower alkyl at least one of the remaining R_1 to R_4 substituents is other than hydrogen and alkyl.

4,222,959

PROCESS FOR THE PREPARATION OF AROMATIC FORMAMIDES

Haven S. Kesling, Jr., Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 961,816, Nov. 17, 1978, abandoned, which is a continuation of Ser. No. 754,152, Dec. 27, 1976, abandoned. This application Jun. 6, 1979, Ser. No. 46,089

Int. Cl.[3] C07C *102/00, 103/34*

U.S. Cl. 260—562 R 15 Claims

1. A process for the preparation of aromatic formamides which comprises reacting an aromatic amine having the structural formula

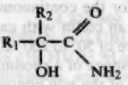
wherein R is an aromatic group comprised of 1 to 3 condensed or non-condensed rings, R_1 is hydrogen, a saturated or unsaturated aliphatic organic group containing up to 30 carbon atoms or an aromatic group comprised of 1 to 3 condensed rings, R_2 is hydrogen or a saturated or unsaturated aliphatic group containing up to 30 carbon atoms and n is at least 1 with carbon monoxide at a temperature of about 60° to 300° C. and a pressure of about 1 to 700 atmospheres in the presence of a sufficient amount of a copper compound catalyst to effect the carbonylation of the aromatic amine, an agent capable of oxidizing copper and a dehydrating agent present in an amount sufficient to remove water formed during said reaction.

4,222,960
PROCESS FOR THE MANUFACTURE OF α-HYDROXYCARBOXYLIC ACID AMIDES

Manfred Wechsberg, Linz, and Rupert Schönbeck, Leonding, both of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

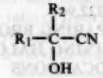
Filed Jun. 5, 1979, Ser. No. 45,677
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1978, 2825267; Austria, Dec. 6, 1978, 4248/78
Int. Cl.² C07C *103/127, 103/26*
U.S. Cl. 260—559 R 8 Claims

1. Process for the manufacture of an α-hydroxycarboxylic acid amide of the formula



(I)

in which R_1 is hydrogen or straight chain or branched alkyl with 1–4 carbon atoms and R_2 is alkyl with 1–6 carbon atoms or phenyl, comprising reacting a cyanohydrins of the formula



(II)

in which R_1 and R_2 are as defined above in an aqueous reaction medium having a pH value of 7–11 and containing from 10 to 60 % by weight of an oxo compound of the formula

(III)

in which R_1 and R_2 have the same meaning as in the cyanohydrine of the formula (II) used in the presence of an catalyst dissolved in the reaction medium selected from the group consisting of alkali metal-, alkaline earth metal- and alkylammonium salts of boric acid.

4,222,961
PROCESS FOR HYDROGENATING AROMATIC DINITRILES

Walter A. Butte, Jr., West Chester; William J. Murtaugh, Eddystone, and Howard P. Angstadt, Media, all of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Feb. 1, 1979, Ser. No. 8,313
Int. Cl.² C07C *85/00*
U.S. Cl. 260—563 D 5 Claims

1. A process for the hydrogenation of aromatic dinitriles to the corresponding cycloaliphatic aminomethyl compounds which comprises:

(1) hydrogenating the nitrile at a temperature of from about 85° to about 150° C. and at a pressure of from about 500 to about 3000 psig in ether solvent containing water and ammonia using nickel or cobalt as catalyst, the amount of water being from about 10% to about 20% by volume of the ether solvent and the amount of ammonia being from about 10% to about 30% by volume of ether solvent,

(2) removing by-products from the aromatic diamine thus produced,

(3) subjecting the purified diamine to hydrogenation at a temperature of from about 50° to about 150° C. and at a pressure of from about 500 to about 2000 psig with a ruthenium catalyst in an aqueous solvent system devoid of ammonia and

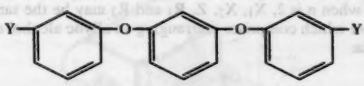
(4) isolating the cycloaliphatic aminomethyl product.

4,222,962
PROCESS FOR PREPARING A SUBSTITUTED DIPHENOXYBENZENE

John P. Pellegrini, Jr., O'Hara Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

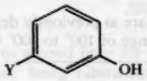
Filed Dec. 11, 1978, Ser. No. 968,508
Int. Cl.² C07C *85/24, 76/02*
U.S. Cl. 260—571 12 Claims

1. A process for the preparation of a compound having the formula:



where Y is NO_2 or NH_2 which comprises:

reacting the alkali metal salt of a phenol having the formula:



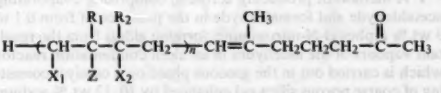
where Y is as defined, with meta-dibromobenzene in the presence of an amine solvent and an Ullmann ether synthesis catalyst and under Ullmann ether synthesis conditions including a temperature of about 115° to 150° C.

4,222,963
SUBSTITUTED PROPARGYL ALCOHOLS, ALLYLIC ALCOHOLS AND UNSATURATED KETONES, AND METHODS FOR THE PRODUCTION THEREOF

Yoshiji Fujita; Fumio Wada; Takashi Ohnishi; Takashi Nishida, all of Kurashiki; Yoshiaki Omura, Okayama; Fumio Mori, Kurashiki; Takeo Hosogai, Kurashiki, and Sukeji Aihara, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

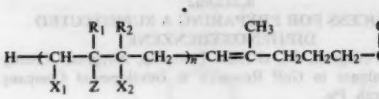
Division of Ser. No. 818,875, Jul. 25, 1977, Pat. No. 4,179,579, which is a continuation-in-part of Ser. No. 746,738, Dec. 2, 1976, abandoned. This application Feb. 28, 1979, Ser. No. 16,195
Claims priority, application Japan, Dec. 2, 1975, 50-144267; Dec. 2, 1975, 50-144268; Dec. 30, 1975, 50-159584; Feb. 16, 1976, 51-16611
Int. Cl.³ C07C *49/203, 45/51, 49/24*
U.S. Cl. 568—384 21 Claims

1. A compound of the formula:

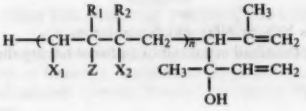


wherein X_1 and X_2 are both hydrogen atoms or wherein one of X_1 and X_2 is a hydrogen atom, the other jointly with Z represents a bond; Z jointly with X_1 or X_2 represents a bond or separately represents a hydrogen atom, a hydroxyl group or a lower alkoxy group; R_1 and R_2 are the same or different and represent hydrogen atoms or lower alkyl groups; n is 1 or 2; and when n is 1, X_1 is a hydrogen atom when X_2 and R_2 are hydrogen atoms, and when n is 2, X_1, X_2, Z, R_1, and R_2 may be the same or different.

14. A method for producing δ,ε-unsaturated ketones of the formula:



wherein X_1 and X_2 are both hydrogen atoms or wherein one of X_1 and X_2 is a hydrogen atom, the other jointly with Z represents a bond; Z jointly with X_1 or X_2 represents a bond or separately represents a hydrogen atom, a hydroxyl group or a lower alkoxy group; R_1 and R_2 may be the same or different and represent hydrogen atoms or lower alkyl groups; n is 1 or 2; and when n is 2, X_1, X_2, Z, R_1 and R_2 may be the same or different which comprises rearranging an allylic alcohol of the formula:



wherein the symbols are as previously defined by heating at a temperature in the range of 100° to 400° C.

4,222,964

2-(2,2-DIHALOVINYL-3,3-DIMETHYLCYCLOPROPYL)ETHANAL

Johannes Van Berkel; Johannes L. M. Syrier, and Hendrik C. Kelderman, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 9, 1979, Ser. No. 55,855

Claims priority, application United Kingdom, Jul. 19, 1978, 30372/78

Int. Cl.[3] **C07C** *47/21*

U.S. Cl. 568—420 **3 Claims**

1. A 2-(2,2-dihalovinyl-3,3-dimethylcyclopropyl)ethanal wherein each halo independently is chloro, fluoro or bromo.

4,222,965

METHOD OF PRODUCING ACROLEIN

Boris N. Gorbunov, prospekt Lenina, 6, kv. 41; Alexandr P. Khardin, ulitsa Krasnopi terskaya, 2, kv. 32, both of Volgograd; Alexandr I. Valdman, ulitsa Sovetskaya 37, kv. 36, Volzhsky, Volgogradskoi oblasti; Vyacheslav K. Rykov, ulitsa Pushkina, 60, kv. 42, Volzhsky, Volgogradskoi oblasti, and Stanislav V. Sukhanov, ulitsa Kommunisticheskaya, 30, kv. 15, Volzhsky, Volgogradskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 471,718, May 20, 1974, abandoned. This application Jun. 29, 1976, Ser. No. 700,955

Claims priority, application U.S.S.R., May 21, 1973, 1923656

Int. Cl.[2] **C07C** *47/22*

U.S. Cl. 568—461 **25 Claims**

1. A method of producing acrolein, comprising evaporating acetaldehyde and formaldehyde in the presence of from 0.1 to 3 wt.% diphenyl-N-nitrosamine; forming aldols from the resultant vapours of the aldehydes in an aldol condensation reactor which is carried out in the gaseous phase on a catalyst consisting of coarse porous silica gel enhanced by 10–12 wt.% sodium silicate at 270°–300° C. in the presence of 0.1 to 3 wt.% diphenyl-N-nitrosamine; cooling the gas mixture resulting at the stage of aldol condensation and which contains acrolein, acetaldehyde, formaldehyde and water in order to produce a condensate; subjecting said condensate to rectification to isolate a mixture of acrolein with acetaldehyde and water, and an aqueous formaldehyde solution; concentrating said aqueous formaldehyde solution and returning same to the aforesaid evaporation stage; subjecting said mixture of acrolein with acetaldehyde and water to rectification in the presence of from 0.1 to 3 wt.% diphenyl-N-nitrosamine to isolate the end product and acetaldehyde containing from 0.2 to 1.5 wt.% acrolein, and returning the acetaldehyde containing from 0.2° to 1.5° wt.% acrolein to the aforesaid evaporation stage.

4,222,966

PROCESS FOR THE MANUFACTURE OF ALDEHYDES

Ludger Bexten, Hünxe; Boy Cornils, Dinslaken; Hans-Dieter Hahn, and Hans Tummes, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,668

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737633

Int. Cl.[2] **C07C** *45/10*

U.S. Cl. 568—451 **18 Claims**

1. In an oxo process for the continuous manufacture of an aldehyde by reaction of an olefin with carbon monoxide and hydrogen at a temperature of 50° to 200° C. under a pressure of 5 to 1,000 bars in the presence of a rhodium catalyst followed by distillative separation of the non-converted feedstocks and low boiling components of the reaction product, the improvement wherein a carbon monoxide/hydrogen mixture containing 2 to 20 parts per million sulfur is employed and residual rhodium catalyst, both dissolved in the distillation residue, are recycled to the reaction zone.

4,222,967

PROCESS FOR PREPARING BROMINE- AND FLUORINE-CONTAINING HALOGENATED HYDROCARBONS

Horst Boehm, and Karl-Heinz Hellberg, both of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,565

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629774

Int. Cl.[2] **C07C** *17/10*

U.S. Cl. 260—653.8 **7 Claims**

1. A process for brominating fluorine- and chlorine-containing halogenated hydrocarbons, which comprises the step of contacting a vapor phase mixture, comprising a halogenated fluorohydrocarbon compound selected from dichlorodifluoromethane, chloro-trifluoromethane or 2,2-dichloro-1,1,1-trifluoroethane, and hydrogen bromide, with a catalyst comprising a mixture of active carbon and at least one bromide of a metal selected from the group consisting of Zn, and Cd at a contact time and a reaction temperature of from about 100° C. to about 500° C. which is sufficient for substituting the chlorine in said halogenated fluorohydrocarbon compound by bromine to form

(a) bromo-chloro-difluoromethane in the case of dichlorodifluoromethane,

(b) bromo-trifluoromethane in the case of chloro-trifluoromethane, or

(c) 2-bromo-2-chloro-1,1,1-trifluoroethane in the case of 2,2-dichloro-1,1,1-trifluoroethane.

4,222,968

METHOD FOR SYNTHESIZING FLUOROCARBON HALIDES

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 8, 1979, Ser. No. 46,898

Int. Cl.[2] **C07C** *19/08*

U.S. Cl. 260—653 **5 Claims**

1. A method for synthesizing perfluoroalkyl halides which comprises the step of reacting:

(a) a perfluorocarbon having the general formula

$$R_fCO_2M$$

wherein R_f is a saturated, straight or branched chain perfluoro-

alkyl radical having from one to 10 carbon atoms and M is a member of the group consisting of the alkali metals and hydrogen; and

(b) a halogen fluorosulfate having the general formula

XSO_3F

wherein X is a member selected from the group consisting of chlorine, bromine and iodine;

(c) maintaining said reaction at an ambient temperature ranging from about 0° C. to 50° C. for a period of time sufficient to produce a perfluoroakyl halide reaction product; and

(d) separating the resulting reaction product.

4,222,969

HYDROCARBON SOLUBLE MAGNESIUM COMPOSITIONS OF HIGH MAGNESIUM CONTENT

Loyd W. Fannin, Dickinson, and Dennis B. Malpass, LaPorte, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Continuation-in-part of Ser. No. 945,665, Sep. 25, 1978, abandoned. This application Apr. 5, 1979, Ser. No. 27,205

Int. Cl.³ C07F *3/02*

U.S. Cl. 260—665 R **21 Claims**

1. A hydrocarbon-soluble composition of matter comprising di-n-butylmagnesium and dimethylmagnesium at a n-butyl:-methyl alkyl group ratio of from about 0.2:1 to about 5:1, to the exclusion of dialkylmagnesium compounds containing alkyl groups other than n-butyl or methyl.

4,222,970

PROCESS FOR PRODUCING PHOSPHONOMYCIN

Roberto Montanari, viale Bianca Maria, 9 Milan, Italy

Continuation-in-part of Ser. No. 811,841, Jun. 28, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,145

Claims priority, application Italy, Aug. 4, 1976, 26005 A/76

Int. Cl.² C07F *9/40*

U.S. Cl. 260—968 **1 Claim**

1. Process for the production of di-t-butyl cis-1,2-propenyl phosphonate which comprises in combination the steps of:

(a) reacting di-t-butylphosphite with triethylamine and ethyl chloroformate to form a mixture of solid triethylamine hydrochloride and liquid solution;

(b) removing the solid triethylamine hydrochloride of step (a) from the liquid solution by filtration;

(c) adding propargylic alcohol to the liquid solution from step (b) and heating gently the resultant mixture at about 40°–50° for about one-half hour thereby obtaining di-t-butyl 1,2-propadienyl phosphonate;

(d) treating the di-t-butyl 1,2-propadienyl phosphonate from step (c) by reduction with an aqueous-ethanolic solution containing hydrazine hydrate and Ni-Raney catalyst to form a reaction mixture, and stirring the reaction mixture at room temperature;

(e) removing the solid Ni-Raney catalyst by filtration after stirring the mixture resultant from step (d) and separating the filtrate as a liquid product; and

(f) recovering the desired aforesaid intermediate composition from the liquid product of step (e) by distillation while removing liquid solvent under reduced pressure, whereby the desired di-t-butyl cis-1,2-propenylphosphonate is obtained.

4,222,971

HUMIDIFIER LINER

Richard L. Eilert, 1321 Surrey Ct., Algonquin, Ill. 60102

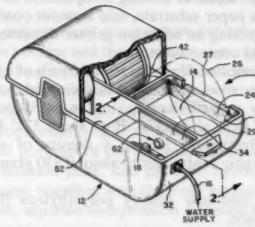
Continuation of Ser. No. 811,781, Jun. 30, 1977, abandoned. This application Nov. 14, 1978, Ser. No. 960,629

Int. Cl.² F24F *3/14*

U.S. Cl. 261—92 **4 Claims**

1. The combination of a water-impervious humidifier liner assembly and a humidifier having a rotatable drum provided with an evaporator medium, a first chamber and a second chamber being provided with a common wall, said first chamber accommodating the rotatable drum so that the water is applied to the evaporator medium, said second chamber providing a reservoir for the water, and an opening in the common wall for passage of the water between said first chamber and said second chamber, wherein the humidifier liner assembly comprises:

a water-impervious first liner for said first chamber, said first liner being substantially conformed to the shape of said first chamber and provided with a first aperture aligned with said opening;



a water-impervious second liner for said second chamber, said second liner being substantially conformed to the shape of said second chamber and provided with a second aperture aligned with said opening; and

a hollow plug, inserted within said opening and press-fitted into said first aperture and said second aperture, said hollow plug being constructed from a water-impervious material which expands upon exposure to water whereby a water-tight seal is created between said plug and said first liner and between said plug and said second liner for the flow of water through said hollow plug between said first liner and said second liner.

4,222,972

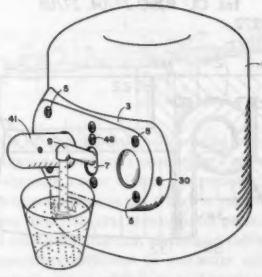
METHOD AND MEANS FOR CARBONATING LIQUIDS IN SITU

Michael C. Caldwell, 352 N. Caswell Rd., Charlotte, N.C. 28204

Filed Jan. 29, 1977, Ser. No. 7,438

Int. Cl.² B01F *3/04*

U.S. Cl. 261—121 R **14 Claims**



1. A self-contained and portable carbonating apparatus comprising a fixed volume rigid container, a resilient bag within the container defining a variable volume carbonating chamber between the resilient bag and the rigid container, a pump communicating with the resilient bag, a relief valve establishing selective communication between the carbonating chamber and the atmosphere, whereby air may be purged from the variable volume carbonating chamber by pumping air into the resilient bag and activating the relief valve.

4,222,973

PROCESS FOR PRODUCING CASTING RELEASE PAPER AND PRODUCT

Klaus B. Kasper, and John A. Hill, III, both of Pulaski, N.Y., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 742,097, Nov. 16, 1976, abandoned.
This application Jul. 10, 1978, Ser. No. 922,975
Int. Cl.[2] B29D *7/02*
U.S. Cl. 264—22 8 Claims

1. A process for the preparation of a cast thermoplastic film having a mirrorlike surface for use in the manufacture of reflective signs comprising the steps of:

(a) applying an aqueous coating composition to at least one surface of a paper substrate, said aqueous coating composition comprising an adhesion primer dispersed in water,

(b) drying said coated substrate,

(c) applying a molten film of at least 0.5 mils of a low density polyethylene over said coated surface, said molten film of low density polyethylene having an extrusion melt temperature of from about 425° F. to about 575° F., said low density polyethylene having a density of about 0.917 grams per cubic centimeter to about 0.930 grams per cubic centimeter,

(d) adhering said low density polyethylene film to said coated surface,

(e) cooling said low density polyethylene film to a temperature below the melt point of said low density polyethylene to form a release paper having a low density polyethylene surface,

(f) applying a solution comprising an organic solvent and a thermoplastic resin soluble in said organic solvent to said release paper on said low density polyethylene surface,

(g) drying said solution to remove said organic solvent and form a thermoplastic resin film on said release paper,

(h) baking said dried thermoplastic resin film on said release paper to remove traces of said solvent, and thereafter,

(i) stripping said baked thermoplastic resin film from said release paper,

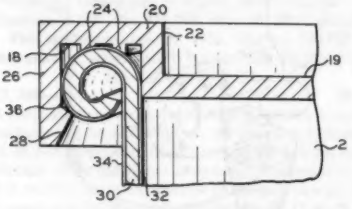
whereby a thermoplastic film having a mirrorlike surface is obtained.

4,222,974

METHOD OF MAKING HERMETICALLY SEALED CONTAINER WITH FRANGIBLE SEAL

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 858,597, Dec. 8, 1977, Pat. No. 4,141,463.
This application Nov. 21, 1978, Ser. No. 962,739
Int. Cl.[2] B29C *27/04, 27/08*
U.S. Cl. 156—272 7 Claims



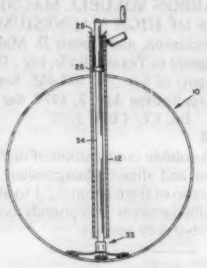
1. A method of hermetically sealing a container, the upper end of which comprises an opening and a rim surrounding said opening, said rim having on its upper surface a bondable coating, with a closure having a top panel, at least one downwardly pointing thermoplastic sealing ring projection generally V-shaped in cross-section which is adapted to rest upon said rim of said container completely around said opening, and a skirt depending downwardly from said top panel and being adapted to surround the outer surface of an upper end of said container, said method comprising heating said at least one sealing ring projection to render said at least one sealing ring projection bondable to the coating on the rim and applying said closure to said container such that said closure bonds to said container only where said sealing rings contact said container.

4,222,975

APPARATUS AND PROCESS FOR REPAIRING UNDERGROUND GASOLINE TANKS

John A. Kirschke, P.O. Box 125, Boerne, Tex. 78006

Filed Jun. 21, 1978, Ser. No. 917,729
Int. Cl.[2] E02D *3/14;* E04H *7/02*
U.S. Cl. 264—35 8 Claims



1. In a method and apparatus for repairing imbedded underground gasoline storage tanks partially filled with a hydrocarbon, said tank having a filler pipe extending from said tank to a remote position from said tank, the steps of:

a. sanding through said filler pipe the interior of the area of the tank to be repaired below the said filler pipe of the said underground storage tank, and

b. injecting through said filler pipe epoxy interior of said tank in the area of the tank to be repaired.

4,222,976

CAVITY FILLING WITH A HOT MELT ADHESIVE COMPOSITION

Donald D. Donermeyer, Springfield, and Joseph G. Martins, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 2, 1978, Ser. No. 948,121
Int. Cl.[2] B32B *35/00*
U.S. Cl. 264—36 18 Claims

1. A method of filling a cavity in a substrate which comprises applying excess adhesive composition as a hot melt into the cavity, spreading the adhesive composition to fill the cavity, cooling the adhesive composition below its crystallization temperature and sanding the adhesive composition to provide a surface even with the surrounding substrate, wherein the adhesive composition comprises a block copolymer, aluminum powder and glass fiber, wherein the block copolymer is selected from the group consisting of copolyesters, copolyamides, copoly(esteramides) and copoly(ether-esters) melting at a temperature of above about 150° C., having from about 30 to about 70 weight percent of hard segments and from about 70 to about 30 weight percent of soft segments; wherein the weight ratio of block copolymer to aluminum powder and glass fiber is in the range of about 3:7 to about 3:2, wherein the weight ratio of block copolymer to glass fiber is at least about 2:1 and wherein the weight ratio of glass fiber to aluminum powder is at least about 1:9.

4,222,977

PROCESS TO PRODUCE INORGANIC HOLLOW FIBERS

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 624,076, Oct. 20, 1975, Pat. No. 4,104,445. This application May 16, 1978, Ser. No. 906,503

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—63 13 Claims

1. A process comprising

(a) preparing a solution of an organic fiber-forming polymer, containing, in a uniformly dispersed form, a sinterable inorganic material;

(b) extruding the inorganic material-containing polymer solution through a hollow fiber spinneret;

(c) forming a polymeric precursor hollow fiber, laden with the inorganic material;

(d) treating the polymeric precursor hollow fiber to remove the organic polymer; and

(e) sintering the inorganic material; provided that steps (d) and (e) are conducted under conditions that maintain a hollow fiber form.

4,222,978

METHOD FOR PRODUCING POLYCRYSTALLINE TRANSLUCENT ALUMINA HAVING AN EXCELLENT IN-LINE TRANSMISSION

Isao Oda, Nagoya, and Koichiro Maekawa, Ichinomiya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 14, 1979, Ser. No. 38,771

Claims priority, application Japan, May 12, 1978, 53-55459

Int. Cl.[2] C04B *35/10*

U.S. Cl. 264—65 2 Claims

1. A method for producing a polycrystalline translucent alumina envelope for a high pressure vapor discharge lamp, which comprises shaping compounded alumina powders having a grain size not larger than 1μ and a purity of more than 99.5% into a given shape, primarily firing the shaped body under vacuum or in an atmosphere of hydrogen gas or dissociated ammonia gas at a temperature within the range 1,300°–1,500° C. and then secondarily firing the primarily fired body at a temperature of 1,650°–1,900° C., for a period of 1–15 hours at least the temperature from 1,400° C. to 1,700° C. being raised at a rate of not lower than 200° C./hr.

4,222,979

MANUFACTURE OF MARBLED DETERGENT BARS

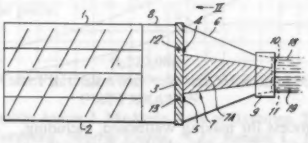
Leslie Hunt, Wirral; Ian T. Nicolson, Birkenhead, and Thomas M. Whitfield, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 22, 1978, Ser. No. 936,080

Claims priority, application United Kingdom, Aug. 25, 1977, 35691/77

Int. Cl.[2] B29F *3/12*

U.S. Cl. 264—75 6 Claims



1. A method of injecting a liquid into a detergent mass comprising passing a detergent mass through two parallel extruders and respective apertured pressure plate means into a common extrusion cone terminating in an extrusion plate, said apertured pressure plate means including two separate multi-apertured portions, injecting a liquid within or immediately downstream of the apertured plate means in at least one position on each of said two multi-apertured portions, arranging a partition transversely of said plate means and between said multi-apertured portions, said partition extending to said extrusion plate and carrying substantial cylindrical cone side surfaces to form separate compression volumes for each detergent stream, and arranging a common extrusion volume between the extruders and the extrusion cone.

6. Detergent processing apparatus suitable for the injection of liquid into a detergent mass, comprising:

(i) two parallel extruders,

(ii) a common extrusion volume arranged downstream of the extruders and into which the two extruders open,

(iii) a common extrusion cone in communication with the extrusion volume, said cone terminating in an extrusion plate,

(iv) apertured pressure plate means between the common extrusion volume and the extrusion cone, said plate means including two separate multi-apertured portions,

(v) liquid injection means positioned within or immediately downstream of the apertured plate means, and

(vi) a partition extending from and between the two multi-apertured portions of the apertured pressure plate means to the extrusion plate, said partition having side surfaces which form, together with the inner surfaces of the extrusion cone, separate compression volumes for each detergent stream.

4,222,980

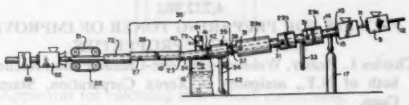
METHOD FOR CONTINUOUSLY MAKING CABLE

John D. Stauffer, De Kalb, Ill.; Edwin H. Arnaudin, Jr., Marion, and Willis L. Chrisman, Fairmount, both of Ind., assignors to Anaconda Wire and Cable Company, Greenwich, Conn.

Continuation of Ser. No. 115,627, Feb. 16, 1971, abandoned, which is a division of Ser. No. 842,418, May 7, 1969, Pat. No. 3,645,656. This application Sep. 29, 1977, Ser. No. 837,985

Int. Cl.[2] B29D *3/00;* B29G *2/00;* B29H *5/28*

U.S. Cl. 264—85 6 Claims



1. A method of continuously vulcanizing coatings on electric cable comprising forming a coating on a cable, passing said coated cable through a zone of heat and pressure in a chamber, maintaining a noncondensing gas which is inert to said coating in said chamber under several atmospheres pressure and which is maintained relatively stagnant about said cable, heating said gas to a temperature sufficient to vulcanize said coating, directly passing said coated cable from said heating zone through a cooling zone within which said coated cable is in contact with a pressurized cooling fluid circulating therein, and isolating the cooling zone from the heating zone by barrier means located both within said cooling zone and between said zones, said barrier means including a sump chamber and at least two apertured plates at opposite ends of said chamber to prevent substantially the noncondensing gas from movement downstream of the sump chamber and the cooling fluid from entering into the heating zone whereby relatively cool pockets can form at the ends of the heating zone to serve as insulation.

4,222,981

PROCESS FOR PREPARING AGGLOMERATES OF CLAYS

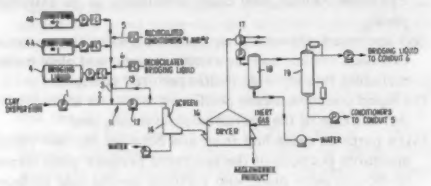
Bruce F. Caswell, Whitmore Lake, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 895,788, Apr. 12, 1978. This application Jun. 1, 1979, Ser. No. 44,515

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] B01J *2/12*

U.S. Cl. 264—117 **6 Claims**



1. A process for dewatering an aqueous clay dispersion and forming pellets of the clay particles, which comprises the steps of:

(a) adding to the aqueous clay dispersion (i) hydrophobic organic bridging liquid which is immiscible with water and (ii) liquid conditioner which is effective to displace water from the clay particles and to render the surfaces of the clay particles oleophilic, whereby to form a two-phase liquid system wherein the clay particles are dispersed in and wetted by said hydrophobic organic bridging liquid as one liquid phase and the other liquid phase is water which is essentially free of clay particles;

(b) agitating the two-phase liquid system to effect repeated collisions of the clay particles and thereby forming in said system a slurry of agglomerates in the water phase wherein said agglomerates consist essentially of the clay particles having said liquid conditioner adsorbed thereon and bound together by said hydrophobic organic bridging liquid;

(c) discontinuing said agitating and separating said agglomerates from the water;

(d) then drying said agglomerates to remove essentially all of said bridging liquid and said liquid conditioner therefrom; and

(e) then recovering said agglomerates.

4,222,982

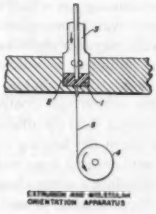
PROCESS FOR PREPARING TONER OF IMPROVED MECHANICAL PROPERTIES

Charles L. Beatty, Webster, and Jean-Claude Pollet, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 19, 1979, Ser. No. 4,633

Int. Cl.[3] B29C *17/00*

U.S. Cl. 264—143 **6 Claims**



1. A process for preparing electrostatographic toner particles having improved mechanical properties and control particle size and particle size distribution comprising forming a blend comprising a molten mass of polymers having an average molecular weight of up to about 260,000 and a colorant selected from the group consisting of pigments and dyes, extruding the blend to provide molecular orientation to the polymers and drawing the blend during cooling and solidifcation of the polymers.

4,222,983

IMPRESSION COMPOSITIONS AND PROCESS FOR PREPARING IMPRESSIONS

Peter August, Seevetal; Wolfgang Hechtl, Burghausen, and Richard Schmidlkofer, Mehring-Öd, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,749

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736421

Int. Cl.[2] B29C *1/02*

U.S. Cl. 264—220 **3 Claims**

1. A process for preparing impressions which comprises crosslinking a composition comprising (a) an organopolysiloxane containing at least 20 mol percent of monoorganosiloxane units and having at least two alkenyl groups per molecule, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms per molecule, (c) a catalyst which promotes the addition of Si-bonded hydrogen to alkenyl groups and (d) 30 to 90 percent by weight of a filler, based on the total weight of the composition, while in contact with the surface of which an impression is to be taken, and thereafter removing the crosslinked structure from the surface.

4,222,984

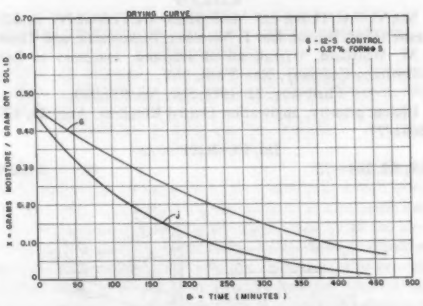
METHOD OF WALLBOARD MANUFACTURE

Richard D. Ladwig, Salina, Kans., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 30, 1978, Ser. No. 955,820

Int. Cl.[2] B29D *27/04;* B29H *7/20*

U.S. Cl. 264—261 **4 Claims**



1. A process for making wallboard, including,

calcining gypsum with which to form a slurry,

mixing with the calcined gypsum a formulation of a calcium lignin sulfonate and ammonium linear alcohol ether sulfate, which formulation is in a ratio, whose range includes 1:1 to 3:1 by weight,

adding water to form a slurry of the mixture,

sandwiching the slurry in a paper envelope to form the wallboard,

and heating the wallboard to drive off enough water to give the wallboard its final desired hardness and strength.

4,222,985

LABORATORY TOOL

Robert G. Greenleaf, Kennett Square, Pa., assignor to Scientific Tools, Inc., Sophia, N.C.

Filed Apr. 27, 1978, Ser. No. 900,810
Int. Cl.[2] B01L *11/00;* B23P *19/04;* B25B *7/02*
U.S. Cl. 422—99 5 Claims

1. A laboratory tool for repairing connections for tubing in which the tubing is provided with a ferrule snugly engaged on the free end of the tubing, said tool comprising a pair of opposed jaw members mounted for displacement toward and away from each other, said members having confronting surfaces, the confronting surface of one of said jaw members having a series of posts projecting therefrom toward the other jaw member, said series of posts being of decreasing diameter arranged with the post of greatest diameter at one end and the post of smallest diameter at the other end, the diameter of each post corresponding substantially to the mean diameter of a given size of laboratory tubing, the other jaw member having a slot extending therethrough and opening in its confronting surface, said slot being open at one end and diminishing in width toward the other end, the slot having portions along its length, each adapted to receive one of said projecting posts when said jaws are closed, the portion receiving the largest post having the largest width, the width of said slot portion being greater than the outside diameter of the size of tubing corresponding to said largest post and smaller than the outside diameter of the ferrule associated with said tubing, the adjacent portion of said slot having a width greater than the outside diameter of the size of tubing corresponding to the next post and less than the outside diameter of the ferrule associated with said tubing, and the portion of the slot receiving the smallest post having a width greater than the outside diameter of the given size of tubing corresponding to the outside diameter of the ferrule associated with said tubing, and the portion of the slot receiving the smallest post having a width greater than the outside diameter of the given size of tubing corresponding to said smallest post and less than the outside diameter of the ferrule for said tubing, whereby when a selected piece of tubing is engaged in said slot, it will position itself substantially in registry with the post corresponding to the size of tubing of said selected piece.

4,222,986

AUTOREFRIGERATION POLYMERIZATION APPARATUS

Stuart B. Smith; James J. McAlpin, both of Baytown, Tex.; Jose M. A. Peruyero, Morris Plains, N.J.; Ronald L. Hazelton, Mendham, N.J., and Edward F. Upchurch, Chatham, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 794,298, May 5, 1977, abandoned, which is a division of Ser. No. 656,983, Feb. 10, 1976, Pat. No. 4,058,562. This application Jan. 9, 1979, Ser. No. 2,153
Int. Cl.[2] B01J *8/10*
U.S. Cl. 422—131 2 Claims

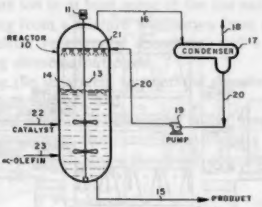
1. An apparatus for conducting autorefrigeration polymerization of C_2 to C_8 alpha-olefins comprising

a reactor adapted to contain a liquid reaction phase and a solvent-diluent vapor phase,

means to remove solvent-diluent vapors overhead from said reactor,

means to condense said vapors, and

means for returning said condensed vapors to said reactor including a plurality of nozzles means for returning said



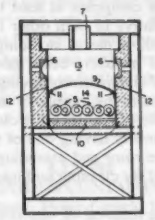
condensed vapors as a spray of drop average size of between 250 and 1000 microns, said nozzle means being located upstream said means for removing the solvent-diluent vapors and intermediate the liquid reaction phase and means for removing the solvent-diluent vapors, each of said nozzle means having an orifice diameter of 0.082 inches.

4,222,987

MUFFLE CALCINER HAVING COUNTER-ROTATING SCREW CONVEYORS

David P. Keller, Morrisville, Pa., assignor to Cities Service Company, Tulsa, Okla.

Filed Jun. 26, 1978, Ser. No. 918,758
Int. Cl.[2] B01J *6/00;* F27B *5/10, 9/20;* F27D *3/08*
U.S. Cl. 422—150 4 Claims



1. Apparatus for calcining iron oxides comprising:

an elongated, insulated chamber having a feed opening and a discharge opening,

conveyor means for transporting calcinable material from the feed opening to the discharge opening, comprising at least one pair of counter-rotating screw conveyors,

heating means mounted within the chamber,

operative to direct heat energy throughout the interior of the chamber, comprising at least one gas-fired ceramic bowl burner,

a muffle mounted within the chamber and extending along the path traversed by the calcinable material, said muffle being positioned within the chamber so that the chamber is divided into two elongated compartments effective to shield and protect the heating means from said material, and said muffle being fabricated of heat-resistant stainless steel and presenting a convex surface to the heating means, and

vent means in the compartment containing said heating means providing an outlet to the exterior of the chamber.

4,222,988

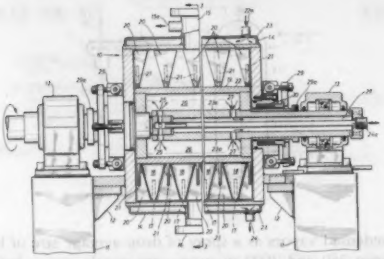
APPARATUS FOR REMOVING HYDROCARBONS FROM DRILL CUTTINGS

Horst K. F. Barthel, Hamburg, Fed. Rep. of Germany, assignor to Oil Base Germany G.m.b.H., Hamburg, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,304

Int. Cl.[3] B01D *17/00;* **C10G** *1/02;* **B02C** *13/06*

U.S. Cl. 422—309 **3 Claims**



1. Apparatus for the removal of hydrocarbon values from drill cuttings from a drilling well which comprises:

a pressure vessel adapted for the introduction of and for the removal of hydrocarbon contaminated drill cuttings;

means to reduce the pressure within said vessel below atmospheric pressure;

means to heat the interior of said vessel to a temperature sufficient to vaporize substantially all of said hydrocarbons, said heat means including an enclosed space adjacent the vessel, Woods metal positioned in said space, and electrical heating means in said space for heating the Woods metal for transferring heat to cuttings in the vessel;

milling means within said vessel for shearing agglomerates of said drill cuttings to expose hydrocarbons contained within said agglomerates;

said milling means comprises at least two sets of members which move relative to each other for shearing the drill cuttings, said milling means including a rotor rotatable in said vessel, said members being generally triangular in shape, one set of said members having one of their corners rigidly connected to the interior of the vessel and extending to the outside of the rotor for cleaning the rotor, the other set of members having one of their corners rigidly connected to the rotor and extending to the interior surface of the vessel for cleaning said interior vessel surfaces, and

an exit port for the removal of vaporized hydrocarbons.

4,222,989

METHOD FOR THE MANUFACTURE OF PURE ALUMINUM OXIDE FROM ALUMINUM ORE

Milan Belsky, Lennestrasse 47, D-5300 Bonn; Albert Schwind, Elbestrasse 17, D-5303 Bornheim-Hersel; Günter Winkhaus, Auf dem Stappenberg 2b, D-5330 Konigswinter 1, and Joseph Schierholt, Franz-Marc-Str. 10, D-4130 Moers 2, Kapellen, all of Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 6,910

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803483

Int. Cl.[2] C01F *7/20*

U.S. Cl. 423—126 **23 Claims**

1. A process for obtaining pure aluminum oxide from siliceous aluminum containing ore, which comprises:

introducing said aluminum containing ore to a starting solution;

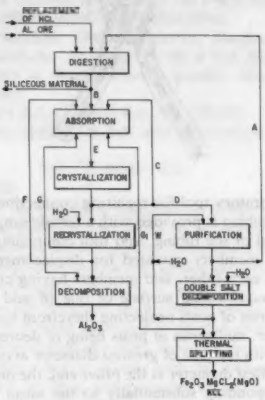
adjusting the HCL concentration of said starting solution to between 15–25% acid by weight;

continuously digesting the aluminum containing ore in said starting solution to form a digestion solution containing aluminum chloride and a suspension of acid insoluble solid materials;

separating said insoluble solid materials from said suspension to form a cleared aluminum chloride solution;

increasing the hydrochloric acid concentration in said cleared aluminum chloride solution to between 14–22% free HCL by weight by absorption of HCL gases evolved and recycled from said subsequent decomposing operation to thereby form an absorption solution;

evaporating said absorption solution by expansion evaporation to crystallize the aluminum chloride from said absorption solution as crude aluminum chloride hexahydrate crystals and simultaneously evolving HCL containing vapors;



condensing said HCL containing vapors and recycling said vapors of said heat of condensation for use in said process;

recycling a portion of the mother liquor from said crystallization into said absorption solution to cool said absorption solution;

decomposing the aluminum chloride hexahydrate to obtain aluminun oxide and decomposition gases; and

recycling the decomposition gases to the absorption solution.

4,222,990

PRODUCTION OF FLUORIDE-FREE PHOSPHATES

Erhart K. Drechsel, Houston, Tex., assignor to Pennzoil Company, Shreveport, La.

Continuation of Ser. No. 870,814, Jan. 19, 1978, abandoned, which is a continuation of Ser. No. 608,973, Aug. 29, 1975, Pat. No. 4,086,322, which is a continuation-in-part of Ser. No. 512,877, Oct. 7, 1974, abandoned. This application Apr. 18, 1979, Ser. No. 31,155

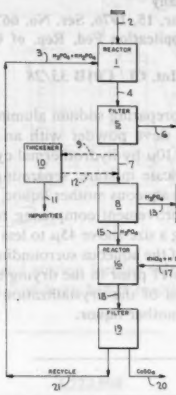
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] C01B *25/22, 25/32*

U.S. Cl. 423—158 **12 Claims**

1. A method for the treatment of phosphate rock to recover phosphoric acid essentially free of fluoride contamination and recover the fluorine values contained in said phosphate rock in useful form in the substantial absence of fluoride gas evolution, which comprises the steps of reacting a fluoride-containing phosphate rock with a solution of phosphoric acid containing values of alkali metal ions as KH_2PO_4, in an acidulation reactor and using sufficient phosphoric acid to acidulate said phosphate rock and form monocalcium phosphate and solubilize the monocalcium phosphate resulting from the reaction, the amount of phosphoric acid used being sufficient to provide a molar ratio of P_2O_5 in the phosphoric acid to P_2O_5 in the rock in the range of about 6:1 to 15:1; said phosphoric acid contain-

ing a sufficient amount of said alkali metal ions as KH_2PO_4 to react with fluorides liberated during said acidulation to convert the fluorides to solid potassium silicofluoride, said reaction being conducted at a temperature in the range of about 70° to 95° C. until the reaction is substantially complete, recovering the resulting slurry (and removing) containing a precipitate



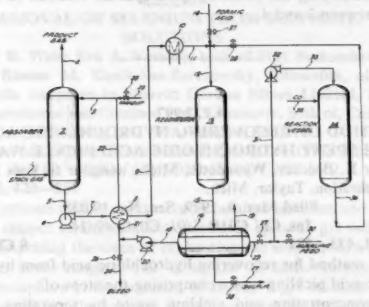
comprising a mixture of potassium silicofluoride, SiO_2, and impurities comprising iron and aluminum phosphates, separating and recovering the solid precipitate, and recovering a solution of monocalcium phosphate in phosphoric acid substantially free from said mixture of potassium silicofluoride, SiO_2, and impurities.

4,222,991

PROCESS FOR REMOVING SO_x AND NO_x COMPOUNDS FROM GAS STREAMS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 18, 1978, Ser. No. 907,189
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—235 **34 Claims**



17. A process for removing SO_x and NO compounds from a feed gas stream and producing a product gas stream essentially free of SO_x and NO, which process comprises:

(1) contacting a feed gas stream containing NO and a sulfur compound selected from the group consisting of SO_2 and SO_3 with an absorbent comprising an aqueous solution containing a dissolved formate-containing compound and a dissolved iron(II) chelate so as to absorb said sulfur compounds and said NO into said absorbent and produce a product gas stream essentially free of NO and SO_x compounds;

(2) withdrawing from step (1) a liquid stream of spent absorbent containing said absorbed sulfur and NO compounds;

(3) regenerating said spent absorbent back to a form active for absorbing SO_x and NO compounds by contacting, in the presence of added formate ion, said spent absorbent with a water-insoluble, anionic ion exchange resin containing basic tertiary amine functional groups and containing formate ion in at least some of the ion exchange sites;

(4) separating from a mixture withdrawn from step (3) elemental sulfur, regenerated absorbent, and a gas stream containing elemental nitrogen;

(5) recycling the separated, regenerated absorbent obtained in step (4) to step (1); and

(6) recovering a stream of elemental sulfur from step (4), a product gas stream from step (1) essentially free of NO and SO_x compounds, and a gas stream containing nitrogen from step (4).

4,222,992

PROCESS FOR THE REMOVAL OF SULFUR OXIDES FROM EXHAUST GASES USING SLURRY OF RED MUD CONTAINING CALCIUM ION

Koichi Yamada; Takuo Harato, and Yasumi Shiozaki, all of Niihama, Japan, assignors to Sumitomo Aluminium Smelting Company, Limited, Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,756
Claims priority, application Japan, Feb. 27, 1978, 53-22398
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 **13 Claims**

1. A process for the removal of sulfur oxides from exhaust gases by absorbing with a slurry of red mud containing calcium ion which comprises the steps of:

(1) contacting an exhaust gas containing sulfur oxides of not higher than about 100° C. with a slurry of red mud containing calcium ion led from the next step (2) to take up sulfur oxides in the gas until pH of the slurry becomes in the range of 4.3 to less than 6 while maintaining the molar fraction of SO_4^{--} to total SO_2 in the slurry within the said pH range at 0.05 to 0.7; and then,

(2) contacting the treated gas with a fresh slurry of red mud containing calcium ion to further take up sulfur oxides in the gas while maintaining the concentration of the $NaHSO_3$ in the slurry at not more than about 8 g/l.

4,222,993

REMOVAL OF NOXIOUS CONTAMINANTS FROM GAS

Heinz Hölter, Gladbeck; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbüscher, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 606,785, Aug. 22, 1975, Pat. No. 4,080,428. This application Nov. 28, 1977, Ser. No. 855,268
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654843; Feb. 24, 1977, 2707935; Jul. 8, 1977, 2730845; Oct. 19, 1977, 2746926
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—243 **23 Claims**

1. In a process for removing sulfur dioxide from gas contaminated therewith and comprising:

(a) contacting the gas with circulating calcium-ion-containing wash liquid having a pH from a maximum initial pH of 12 to a minimum subsequent pH of 3;

(b) adding to the gas-contacted circulating wash liquid acid or salt ingredient means to increase the degree of calcium-ion dissociation therein,

(c) oxidizing the ingredient-means-containing circulating wash liquid to produce calcium sulfate;

(d) adding to the circulating wash liquid a sufficient amount of a substance selected from the group consisting of calcium carbonate, calcium oxide and calcium hydroxide to form calcium-sulfur compounds from components in the

circulating wash liquid and to provide said circulating wash liquid with calcium ions for step (a), and

(e) clarifying the circulating wash liquid before contacting the sulfur-dioxide-containing waste gas therewith; the improvement wherein the wash liquid of step (a) contains, in combination, anions of a strong inorganic acid and anions of a polybasic carboxylic acid.

4,222,994

SOLVENT EXTRACTION PURIFICATION OF WET-PROCESSED PHOSPHORIC ACID

Klaus-Peter Ehlers, Erftstadt; Wolfgang Scheibitz, Hürth-Knapsack; Klaus Schrödter, Cologne, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

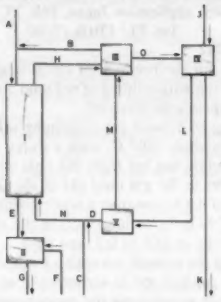
Filed Dec. 12, 1977, Ser. No. 859,681

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657189

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 S **10 Claims**



1. In the process for purifying wet-processed phosphoric acid, wherein the phosphoric acid to be decontaminated is extracted countercurrently in an extraction zone with a C_5-alcohol; the resulting organic phosphoric acid solution, termed extract, is separated from contaminants unabsorbed by the alcohol, termed raffinate; the decontaminated phosphoric acid is recovered from the alcohol either in the form of free acid by reextracting the organic phosphoric acid solution with water, or in the form of an alkali metal phosphate by reacting the organic phosphoric acid solution with an alkali and the remaining alcohol saturated with water is recycled to the process, the improvement which comprises:

(a) decontaminating a crude phosphoric acid containing 43 to 50 weight % of P_2O_5;

(b) dehydrating the alcohol being recycled to a water content of 15 to 30% than would correspond to the saturation concentration;

(c) mixing the alcohol so dehydrated with a mineral acid other than phosphoric acid in a quantity corresponding to the quantity, in moles, of cation-bound phosphate in the crude acid;

(d) delivering the alcohol-acid mixture obtained to the extraction zone in amounts corresponding to 5.5 to 2.5 parts by volume of acid; and

(e) using an amount of alcohol which would insure a flowable raffinate.

4,222,995

PROCESS FOR THE PRODUCTION OF ALUMINUM SILICATES

Wolfgang Roebke, Altenstadt; Dieter Kneitel, and Erfried Parr, both of Rodenbach, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel & Cie, Dusseldorf-Holthauser, both of, Fed. Rep. of Germany

Filed Mar. 15, 1976, Ser. No. 667,195

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1975, 2514399

Int. Cl.[3] C01B *33/28*

U.S. Cl. 423—329 **3 Claims**

1. In a process of preparing sodium aluminate silicate Type A zeolite molecular sieve powder with an average particle diameter of less than 10μ by hydrothermal cyrstallization of a sodium aluminum silicate mixture, separating the crystallization product from the aqueous mother liquor, drying, and then comminuting the improvement comprising reducing the portion of particle having a size above 45μ to less than 1 weight % by adjusting the pH of the aqueous surrounding the crystallization product to 8.5 to 11 prior to the drying by addition of an acid before separation of the crystallization product from a slurry of product in mother liquor.

4,222,996

PREPARATION OF GOLD CYANIDE

Yutaka Okinaka, Madison, and Lawrence E. Smith, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 1, 1979, Ser. No. 80,993

Int. Cl.[3] C01C *3/08*

U.S. Cl. 423—371 **19 Claims**

1. A process for making gold (I) cyanide from an aqueous alkaline gold solution capable of yielding gold (I) ions with pH in the alkaline range characterized in that the process comprises the steps of

(a) adding to an aqueous gold alkaline solution capable of yielding gold (I) ions an amount of cyanide ion which is within 10 percent of the stoichiometric amount for the formation of a gold (I) cyanide resulting in a gold cyanide solution;

(b) acidifying the resulting gold cyanide solution to a pH between 2 and 4.

4,222,997

METHOD OF RECOVERING HYDROCHLORIC ACID FROM SPENT HYDROCHLORIC ACID PICKLE WASTE

Brazier K. Beecher, Wyandotte, Mich., assignor to Voss Steel Corporation, Taylor, Mich.

Filed Mar. 9, 1979, Ser. No. 19,033

Int. Cl.[2] C01B *7/01*; C01G *49/14*

U.S. Cl. 423—481 **8 Claims**

1. A method for recovering hydrochloric acid from hydrochloric acid pickling waste comprising the steps of:

(a) concentrating said pickling waste by separating said waste into (1) a vapor overhead stream of hydrogen chloride vapor and water vapor and (2) an underflow stream of strong pickling waste;

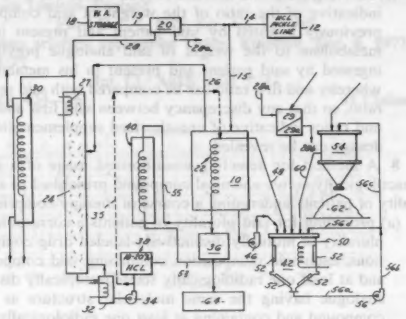
(b) separating by means of a fractionator said overhead stream into (1) water vapor and (2) hydrochloric acid;

(c) storing said fractionated hydrochloric acid;

(d) reacting said concentrated underflow stream of strong pickling waste with concentrated sulphuric acid in a double exchange reactor;

(e) circulating and condensing hydrogen chloride liberated

by said double exchange reaction and the hydrogen chloride from said concentrated pickling waste;



(f) filtering out and storing ferrous sulphate monohydrate formed in said double exchange reaction.

4,222,998

PRODUCTION OF BISMUTH TRICHLORIDE

Thomas G. Buckle, and Andrew I. Bellingham, both of Sydney, Australia, assignors to Warman International Limited, Artarmon, Australia

Filed May 24, 1979, Ser. No. 42,079
Claims priority, application Australia, May 26, 1978, PD4515
Int. Cl.[2] C01G *29/00*
U.S. Cl. 423—491 6 Claims

1. A process for the production of anhydrous bismuth trichloride which comprises the steps of establishing a molten bath of metallic bismuth and bismuth trichloride at a temperature below the boiling point of the trichloride and introducing dry gaseous chlorine for reaction with the bismuth until all the bismuth has reacted therewith.

4,222,999

REMOVAL OF SELENIUM FROM SULPHATE SOLUTIONS

Donald R. Weir; Eva A. Vosahlo, both of Fort Saskatchewan, and Roman M. Genik-Sas-Berezowsky, Edmonton, all of Canada, assignors to Sherritt Gordon Mines Limited, Fort Saskatchewan and Cominco Ltd., Vancouver, both of, Canada

Filed Aug. 14, 1978, Ser. No. 933,214
Claims priority, application Canada, Aug. 19, 1977, 285109
Int. Cl.[2] C01G *3/10*; C01B *19/00*; C25C *1/12*
U.S. Cl. 423—557 4 Claims

1. A process for the removal of hexavalent selenium and iron from a copper sulfate solution containing up to 25 g/l sulfuric acid comprising the steps of (a) heating the solution to a temperature in the range of 182° C. to 220° C. under an oxygen-free atmosphere in the presence of at least 3 g/l bivalent iron and maintaining the solution at said temperature for a time in the range of 2 minutes to 10 hours sufficient to substantially convert hexavalent selenium to tetravalent selenium, and (b) treating the solution from step (a) by pressure oxidizing the bivalent iron with oxygen to trivalent iron while hydrolyzing the trivalent iron formed at a temperature in the range of about 180° to 210° C. to precipitate the iron out of solution as ferric oxide and co-precipitate the converted selenium in tetravalent form out of solution with the ferric oxide to obtain a final solution containing less than 0.5 g/l iron and less than 0.04 mg/l selenium.

4,223,000

DECOMPOSITION OF ALUMINUM NITRATE

John L. Dewey; Charles E. Scott, and John C. Rushing, all of Little Rock, Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jul. 27, 1979, Ser. No. 61,297
Int. Cl.[2] C01F *7/30*
U.S. Cl. 423—631 6 Claims

1. A process for the decomposition of aluminum nitrate to alumina comprising the steps of:

(a) melting the aluminum nitrate crystals;

(b) evaporating from the melted crystals in a once through evaporator at the boiling temperature of the crystals and for a time sufficient to remove water and associated nitric acid and to provide a fluid feed having an alumina concentration of at least about 18% by weight and capable of feeding through a nozzle;

(c) decomposing the product of step (b) in a fluidized bed decomposer at a temperature of between about 150° and about 200° C. and recovering the heat of condensation of the resultant vapors for beneficial reuse;

(d) decomposing the product of step (c) in a fluidized bed decomposer at a temperature of between about 300° and about 400° C. to reduce the residual nitrate concentration to between about 5 and about 10 weight percent;

(e) decomposing the product of step (d) in a fluidized bed decomposer at a temperature of between about 540° and about 800° C. to reduce the residual nitrate concentration to below about 2 weight percent; and

(f) calcining the product of step (f) at a temperature of at least about 1000° C.

4,223,001

PRODUCTION OF HYDROGEN FROM CARBON MONOXIDE AND WATER

Miroslav Novotny, Randolph, and Lowell R. Anderson, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jun. 20, 1978, Ser. No. 917,219
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.[2] C01B *1/02*
U.S. Cl. 423—655 5 Claims

1. In a process for producing hydrogen and carbon dioxide including contacting carbon monoxide under homogeneous conditions with an alkaline aqueous liquid phase, containing a soluble Group VIII metal catalyst, at a reaction temperature from about 100° to 300° C. and at a reaction pressure from about 1 to 300 atmospheres, the improvement which comprises conducting the process in the presence of a saturated paraffinic water-soluble alcohol and said metal catalyst consisting essentially of a rhodium compound selected from the group consisting of rhodium chloride, rhodium carbonyl chloride and chodium carbonyl iodide, and being soluble in the reaction medium.

4,223,002

ISOLATION OF ALPHA$_1$-FETOPROTEIN

Edward S. Newman, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 846,089, Oct. 27, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,662
The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.
Int. Cl.[2] G01N *33/16*; A61K *43/00*; C07G *7/00*
U.S. Cl. 424—1 34 Claims

1. A process for producing purified alpha$_1$-fetoprotein comprising:

(a) buffering a sample of a biological source material known to contain alpha$_1$-fetoprotein to a pH of about 7;

(b) subjecting said buffered sample to affinity chromatography by passage through a column containing an antibody

specific for alpha$_1$-fetoprotein immobilized on a solid support and subsequently eluting the bound alpha$_1$-fetoprotein by treatment of the column with a suitable desorbing agent;

(c) removing substantially all of the albumin present in the eluate from step (b) by subjecting it to adsorption chromatography by passage through a column containing an immobilized reactive dye adsorbent;

(d) dialyzing the unadsorbed alpha$_1$-fetoprotein-containing solution from step (c);

(e) lyophilizing the dialyzed solution from step (d);

(f) dissolving the powder formed in step (e) in a suitable buffer and subjecting eh resulting solution to polyacrylamide gel electrophoresis.

33. In a radioimmunoassay for the alpha$_1$-fetoprotein in an unknown comprising:

(a) forming a complex of the alpha$_1$-fetoprotein in the unknown with antiserum;

(b) adding thereto radiolabeled alpha$_1$-fetoprotein;

(c) removing the resulting complex from solution; and

(d) measuring the amount of radiolabeled alpha$_1$-fetoprotein taken up against a standard the improvement which comprises utilizing as said radiolabeled alpha$_1$-fetoprotein purified from monkey source material according to the method of claim 1.

4,223,003

PASTE AND POWDER DENTIFRICES

Hans-Ulrich Scheller, Uhingen, Fed. Rep. of Germany, assignor to Württembergische Parfumerie-Fabrik GmbH, Eislingen, Fed. Rep. of Germany

Filed Apr. 20, 1979, Ser. No. 31,717

Int. Cl.^{2} A61K *7/16, 7/18, 7/20, 7/22*

U.S. Cl. 424—7 **8 Claims**

1. In the method of tooth brushing with dyed paste or powder dentifrice containing a physiologically compatible dye and at least 2.5 weight % of a high-foam surfactant, the improvement whereby fading of the original color as observable by the user in a bathroom mirror automatically indicates the optimum cleaning time when the teeth are vigorously cleaned with a toothbrush wherein the colored foam generated by the dentifrice at the beginning in at least about 20 seconds becomes white or only pale in color.

4,223,004

DRUG COMPOSITIONS

Jen C. Hsia, Don Mills; Arthur E. Le Blanc, Toronto, and Joan A. Marshman, Agincourt, all of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Filed May 23, 1977, Ser. No. 799,309

Claims priority, application United Kingdom, May 24, 1976, 21443/76

Int. Cl.^{2} A61K *29/00;* **G01N** *33/16*

U.S. Cl. 424—9 **17 Claims**

1. A method for detecting unauthorized supplementation of a prescribed pharmacological dosage given to a patient, comprising the steps of:

(a) providing a drug composition comprising a pharmacologically-active compound and a radiologically stable, isotopically distinct analogue having the same molecular structure as said compound and containing at least one radiologically-stable isotopic atom, said compound and said analogue being present in a first ratio by weight;

(b) providing the patient with a prescribed dosage of the composition;

(c) subsequently obtaining a physiological specimen of body fluid from the patient;

(d) subjecting the specimen to analysis to determine a first value indicative of the weight of a substance selected from the group consisting of said compound and its metabolites, and a second value indicative of the weight of a substance selected from the group consisting of said analogue and its corresponding metabolites; and

(e) deriving from said first and second values a second ratio indicative of the ratio of the weight of said compound previously ingested by said patient and present in his metabolism to the weight of said analogue previously ingested by said patient and present in his metabolism; whereby said first ratio can be compared with said second ratio, so that any discrepancy between said first and second ratios indicative of unauthorized supplementation of dosage can be revealed.

8. A method for detecting unauthorized usage of a pharmacologically-active chemical compound prescribed to a plurality of patients undergoing a course of therapy comprising:

(a) providing for said plurality of patients a corresponding plurality of mutually distinctively-labeled drug compositions, each said composition comprising said compound and at least one radiologically stable isotopically distinct analogue having the same molecular structure as said compound and containing at least one radiologically-stable isotopic atom and each composition being distinguished from each other composition by the presence of said radiologically stable isotopically distinct analogue

(b) administering a prescribed dosage of said compositions to the patients, each patient receiving a different composition;

(c) obtaining a physiological specimen of a body fluid from a person suspected of receiving amounts of said compositions diverted from at least one patient in the group;

(d) subjecting said specimen to analysis to determine in said specimen values indicative of weights of substances selected from the group consisting of:

(i) said compound and each isotopic analogue thereof; and

(ii) metabolites of said compound and corresponding metabolites of said isotopic analogues; and

(e) deriving from said values a weight ratio indicative of the relative amounts of said compound and of said analogues ingested by the person undergoing testing, whereby an indication of diversion of said compositions may be obtained.

4,223,005

ANTIBODY COATED BACTERIA

Marius C. Teodorescu, Oak Park; Eugene P. Mayer, and Sheldon Dray, both of Chicago, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation of Ser. No. 637,319, Dec. 3, 1975, abandoned. This application Feb. 15, 1979, Ser. No. 12,326

Int. Cl.^{3} G01N *33/48, 33/50, 33/54*

U.S. Cl. 424—12 **12 Claims**

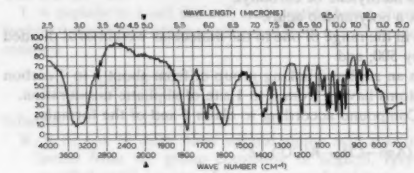
1. A method for identification and enumeration of a subpopulation of lymphocytes in an unseparated peripheral blood sample, said subpopulation bearing a characteristic antigen on the membrane of its cells, which method comprises contacting said sample with a bacteria having no natural affinity for said subpopulation, said bacteria being coated with antibody directed against said antigen, whereby said bacteria binds only with said cell subpopulation, preparing a smear of said sample, and identifying and counting said subpopulation of lymphocytes in said smear by noting the presence of said bacteria bound to the cells thereof.

9. A composition for use in simultaneous identification and enumeration of B lymphocytes and T lymphocytes in the peripheral blood of an animal, which composition comprises a mixture of two morphologically distinguishable types of bacteria having no natural affinity for either of said lymphocytes, one of said types of bacteria being chemically coated with an antibody specific to an antigen associated with B lymphocytes and the other of said types being chemically coated with an antibody specific to an antigen associated with T lymphocytes, the quantity of antibody in said coating being sufficient to cause the bacteria to bind to a lymphocyte bearing the corresponding antigen.

4,223,006
COATED PARTICLES

Charles B. Taskis, Worthing, England, assignor to Beecham Group Limited, England

Filed Dec. 4, 1978, Ser. No. 965,865
Claims priority, application United Kingdom, Dec. 8, 1977, 51058/77
Int. Cl.[2] A61K *9/28, 9/32*
U.S. Cl. 424—16 41 Claims



1. Pharmaceutically acceptable particles comprising an anhydrous hygroscopic salt of clavulanic acid dispersed in a polymeric binder having a water vapour permeability at 40° C., 90% R. H. of less than 1×10^{-8} g cm/cm^2 sec. cm. Hg.

4,223,007
MICROBIAL INSECTICIDE

Kemet D. Spence, Potlatch, Id., and Robert E. Andrews, Pullman, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 835,817, Sep. 22, 1977, abandoned. This application Apr. 27, 1979, Ser. No. 33,895
Int. Cl.[2] A61K *39/02, 39/12;* C12K *1/08;* A01N *15/00*
U.S. Cl. 424—16 6 Claims

1. An insecticidal composition comprising a microbial insect pathogen of viral, bacterial, or fungal origin which is susceptible to sunlight-induced inactivation embedded in a coacervate microbead having an effective diameter within the range of from about 10 to about 200 microns which is comprised of a nucleic acid and a proteinaceous material admixed in a nucleic acid to proteinaceous material ratio in the range of from about 1:5 to about 5:1, whereby the microbead structure itself effectively shields the pathogen from sunlight-induced inactivation.

4,223,008
SLOW RELEASE PHARMACEUTICAL COMPOSITIONS CONTAINING 3-[2-(4-BENZAMIDO-1-PIPERIDYL)ETHYL]INDOLE, EMBONATE

George K. E. Gregory, Marlow, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed May 14, 1979, Ser. No. 38,595
Claims priority, application United Kingdom, May 30, 1978, 24646/78
Int. Cl.[2] A61K *9/32, 9/36*
U.S. Cl. 424—32 3 Claims

1. A pharmaceutical composition in tablet form having an enteric coating and comprising 3-[2-(4-benzamido-1-piperidyl-)ethyl]indole, embonate in association with a pharmaceutically acceptable carrier.

4,223,009
HAIR PREPARATION CONTAINING VINYL PYRROLIDONE COPOLYMER

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,397
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.[2] A61K *7/06, 7/11*
U.S. Cl. 424—47 17 Claims

1. A hair setting and conditioning composition comprising, approximately by weight,

I. 0.1 to 35% of a film-forming copolymer having a molecular weight of about 15,000 to 1,500,000 and containing

A. about 99.5 to 45.1 mole percent of units derived from vinyl pyrrolidone,

B. 0.5 to 4.9 mole percent of units derived from a monomer of the formula

$$CH_2{=}CR^1{-}COOR^2{-}NR^3R^4$$

wherein
R^1 is H or CH_3,
R^2 is $C_{1\text{-}20}$ alkylene, and
R^3 and R^4 are independently $C_{1\text{-}4}$ alkyl, and

C. 0 to about 50 mole percent of units derived from at least one ethylenically unsaturated copolymerizable monomer different from A and B,

II. 0.05 to 10% of at least one member selected from the group consisting of cosmetically acceptable organic surface active agents, thickening agents, plasticizers and sequestering agents, in

III. a solvent base selected from the group consisting of water, monohydric $C_{2\text{-}3}$ aliphatic alcohols, 1,1,1-trichloroethane, methylene chloride, and mixtures thereof.

2. A pressurized aerosol hair spray containing about 10 to 70% of a propellant and a hair setting or conditioning amount of a composition as defined in claim 1.

4,223,010
BASIC ZIRCONIUM COMPLEXES AND METHODS OF MAKING AND USING IN ANTIPERSPIRANTS

Andrew M. Rubino, New Providence; John L. Jones, Watchung, and Edward S. Bretschneider, North Plainfield, all of N.J., assignors to Armour Pharmaceutical Company, Berkley Heights, N.J.

Division of Ser. No. 764,627, Feb. 2, 1977, Pat. No. 4,148,812. This application Jan. 8, 1979, Ser. No. 2,040
Int. Cl.[2] A61K *7/34;* C07F *7/00*
U.S. Cl. 424—66 11 Claims

1. An astringent complex useful as an antispirant consisting essentially of the reaction product of:

(a) a compound selected from the group consisting of aluminum halide, basic aluminum halide, basic aluminum sulfate, basic aluminum nitrate, basic aluminum sulfamate, basic aluminum phenolsulfonate, zirconium oxy salt, zirconium hydroxy salt, trioxodizirconyl hydroxy salt, and mixtures thereof; and

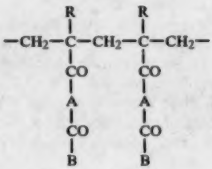
(b) a freshly prepared basic zirconium compound selected from the group consisting of zirconium hydroxide gel, basic zirconium carbonate gel and mixtures thereof, said compounds being present in such amounts as to yield in the complex an Al/Zr mole ratio of about 10:1 to 1:10.

4,223,011
THERAPEUTIC COMPOSITIONS CONTAINING POLYMERS HAVING POLYUNSATURATED ACID RADICALS

Paolo Ferruti, V.le Cassiodoro, 24, and Rodolfo Paoletti, V.le Regina Margherita, 43, both of Milano, Italy

Division of Ser. No. 737,546, Nov. 1, 1976, Pat. No. 4,145,320, which is a continuation-in-part of Ser. No. 622,441, Oct. 14, 1975, abandoned. This application Mar. 9, 1979, Ser. No. 18,986
Claims priority, application Italy, Oct. 15, 1974, 28419 A/74
Int. Cl.[2] A61K *31/78;* **C08L** *91/00*
U.S. Cl. 424—81 **4 Claims**

1. A therapeutic composition containing a therapeutically effective dose of a non-toxic polymer having a molecular weight between 1,000 and 1,500,000 characterized in that it contains the radical of a polyunsaturated acid selected from the group consisting of 8,11,14-eicosatrienoic acid; 5,8,11,14-eicosatetraenoic acid; and 5,8,11,14,17-eicosapentenoic acid, bound to a macromolecular backbone of polyacrylic or polymethacrylic units through oxyalkylenic, aminoalkylenic, or oxyaminoalkylenic chains, said polymer containing units of the formula



wherein R is H or CH_3, A represents an alkylene radical terminated at its ends with an —NH— group or an —O— group, and B represents a radical of such polyunsaturated acid sans a carboxylic group and a pharmaceutically acceptable carrier.

4,223,012
METHOD FOR CONTROL OF SAN JOSE SCALE

Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Apr. 2, 1979, Ser. No. 26,156
Int. Cl.[2] A01N *17/14*
U.S. Cl. 424—84 **3 Claims**

1. In a method for the control of San Jose scale, *Quadraspidiotus perniciosus,* by subjecting said scale to an attractant in an amount sufficient to attract the scale to a particular location, the improvement which comprises the use as said attractant of an effective amount of (E)-3,7-dimethyl-2,7-octadein-1-yl propionate.

4,223,013
AMITRIPTYLINE CONJUGATES TO ANTIGENIC PROTEINS AND ENZYMES

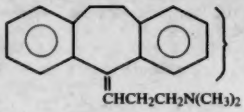
Mae W. Hu, Sunnyvale, and Prithipal Singh, Santa Clara, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Dec. 29, 1978, Ser. No. 974,294
Int. Cl.[2] A61K *39/00, 45/02*
U.S. Cl. 424—85 **14 Claims**

1. Compound of the formula;

$$(Ami—X—RCO—)_nZ$$

wherein:
Ami is of the formula:



X is methylene or carbonyl;
Z is a poly(amino acid):
n is in the range of one to the molecular weight of Z divided by 500; and
R is an aliphatic linking group of from about 1 to 7 carbon atoms having from 0 to 1 site of aliphatic unsaturation.

4. Compound according to claim 1 and of the formula:

$$(Ami—CH_2—R^1CO-)_{n1}Z^1$$

wherein:
Ami is defined in claim 1;
R^1 is alkylene of from 1 to 7 carbon atoms;
n^1 is at least 1 and not greater than the molecular weight of Z^1 divided by 500; and
Z^1 is a poly(amino acid).

4,223,014
SPRAY IMMUNIZATION OF FISH

Robert L. Garrison; Rowan W. Gould; Patrick J. O'Leary, and John L. Fryer, all of Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 769,128, Feb. 16, 1977, abandoned. This application May 8, 1978, Ser. No. 903,430
Int. Cl.[2] A61K *39/02, 39/12, 9/12*
U.S. Cl. 424—92 **7 Claims**

1. A method for vaccinating fish against diseases including *Vibrio anguillarum, Aeromonas salmonicida,* and furunculosis, comprising disposing said fish out of water by removal therefrom and into air, and spraying an antigenic composition of killed *Vibrio anguillarum,* or *Aeromonas salmonicida,* or furunculosis bacterins upon the exterior of the fish in the absence of any physical contact between said water and said fish.

4,223,015
COMPOSITION FOR TREATING SKIN DISEASES

Masaka Matsubara, A-1001 Yushima-haitaun,4/6/11, Yushima, Bunkyo-ku, Tokyo-to, Japan; Tatsuo Ishihara, and Tokitaka Mori, both of Tokyo, Japan, assignors to Masaka Matsubara, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,020
Claims priority, application Japan, Mar. 31, 1976, 51-34291
Int. Cl.[2] A61K *35/56*
U.S. Cl. 424—95 **8 Claims**

1. A process for preparing a parenteral solution for treating the following diseases:
pustulosis palmaris et plantaris, pruritus senilis, trichophytia pompholyciformis, psoriasis vulgaris, Behcet disease, verruca vulgaris, or acne vulgaris,
comprising
(1) freeze-drying an aqueous extract of paramecium to obtain a dry powder P_1,
(2) dissolving the dry powder P_1 in water and separating the aqueous solution into a high-molecular-weight portion A and a low-molecular-weight portion B,
(3) freeze-drying an aqueous solution of the portion B to obtain a dry powder P_2, and
(4) dissolving the dry powder P_2 in an excipient to formulate the parenteral solution,
the amount of dry powder P_1 used being sufficient to provide a parenteral solution of P_2 of a concentration from about 0.01 to 1.0 wt./vol. percent.

4,223,016
PEPTIDES

Peter Roy, Cowfield; Brian G. Overell, Dorking, and Denis R. Stanworth, Malvern, all of England, assignors to Beecham Group Limited, United Kingdom

Filed Jun. 29, 1978, Ser. No. 920,151

Claims priority, application United Kingdom, Jun. 29, 1977, 27140/77

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **15 Claims**

1. A peptide or a salt thereof, said peptide being characterized by the presence of the sequence of from 6 to 12 amino acid residues

$$[(R_1)—(R_2)—(R_3)]$$

wherein

R_1 is (i) one or more basic natural amino acid residues selected from the group consisting of arginyl, lysyl and ornithyl or (ii) a group of one or more of said basic natural amino acid residues and one or more neutral, non-hydrophobic natural amino acid residues selected from the group consisting of glycyl, alanyl, seryl and threonyl;

R_2 is one or more of said neutral, non-hydrophobic natural amino acid residues; and

R_3 is (i) one or more hydrophobic natural amino acid residues selected from the group consisting of phenylalanyl, valyl and leucyl or (ii) a group of one or more of said hydrophobic natural amino acid residues and one or more of said neutral, non-hydrophobic natural amino acid residues,

said peptide having the formula:

$$X—(R)_n[(R_1)—(R_2)—(R_3)]Y$$

wherein

X is hydrogen or a terminal amino protecting group,

Y is hydroxy or a terminal carboxylic acid protecting group;

R is a group capable of conferring resistance to enzymatic breakdown of a peptide; selected from prolyl and hydroxyprolyl and

n is 0 or 1.

4,223,017
BIOLOGICALLY ACTIVE AMIDES

Norman R. Lazarus, Gravesend, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 851,706, Nov. 15, 1977, which is a continuation-in-part of Ser. No. 676,645, Apr. 14, 1976, abandoned. This application Feb. 8, 1979, Ser. No. 10,361

Claims priority, application United Kingdom, Apr. 15, 1975, 15414/75; Mar. 31, 1976, 12495/76

Int. Cl.[2] **A61K** *37/00*

U.S. Cl. 424—177 **9 Claims**

1. A method of treating a mammal for hyperglycaemia comprising the parenteral administration to the mammal suffering from hyperglycaemia of a nontoxic hyperglycaemia treatment effective amount of a polypeptide designated Pancreatic Hormone III or a pharmaceutically acceptable salt or metal complex of said polypeptide.

4,223,018
BATH COMPOSITION

Jimmie Belle, 1900 Main St. #5, Boise, Id. 83706

Filed Feb. 9, 1979, Ser. No. 10,998

Int. Cl.[2] **A61K** *31/595, 31/365, 35/78, 37/00*

U.S. Cl. 424—177 **1 Claim**

1. A bath composition which is added to a user's bath water comprising:

about 0.048 to 0.049 percent by weight of 6 M hydrochloric acid;

about 1.08 to 1.11 percent by weight of ascorbic acid;

about 19.22 to 19.60 percent by weight of protein in powder form consisting essentially of calcium caseinate, lactalbumin, non-fat dry milk, soy protein isolate, defatted whole egg powder, and lecithin where the protein makes up about 76–79 percent of the powder;

about 76.83 to 78.38 percent by weight of olive oil;

about 1.10 to 1.12 percent by weight of vitamin D_2 in propylene glycol; and

about 0.72 to 0.74 percent by weight of vitamin A in sulfurized castor oil.

4,223,019
SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,531

Int. Cl.[2] **A61K** *37/00;* **C08L** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **16 Claims**

1. A peptide having a formula

X—Y—Z—E—G—J—L

and the pharmaceutically acceptable non-toxic acid addition salts thereof, wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Y is selected from a group consisting of D-Lys and D-Arg;

Z and J are independently selected from a group consisting of Tyr, Trp, and Phe;

E and G are independently selected from a groupconsisting of D—Tyr,D—Trp, and D—Phe; and

L is selected from a group consisting of $—CONH_2$, —CONHR, $—CONHR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branched alkyl groups containing 1–6 carbon atoms.

4,223,020
SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,554

Int. Cl.[2] **A61K** *37/00;* **C08L** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **34 Claims**

1. A peptide having the formula

X-Y-Z-E-G-J

and the pharmaceutically acceptable non-toxic acid addition salts thereof, wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Y and G are independently selected from a group consisting of Tyr, Trp, and Phe;

Z and E are independently selected from a group consisting of D-Tyr, D-Trp, and D-Phe; and

J is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branched chain alkyl groups containing 1–6 carbon atoms.

4,223,021

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,555
Int. Cl.[2] A61K *37/00;* **C07C** *103/52;* **C08L** *37/00*
U.S. Cl. 424—177 **12 Claims**

1. A peptide having a formula

X-Tyr-Gly-D-Trp-Phe-D-Phe-L

and the pharmaceutically acceptable non-toxic acid addition salts thereof, wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$; and

L is selected from a group consisting of $—CONH_2$, $—CONHR$, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branch alkyl groups containing 1–6 carbon atoms.

4,223,022

STABILIZED AMINOGLYCOSIDE ANTIBIOTIC FORMULATIONS

Bernard E. Rosenkrantz, Bloomfield, and Elliot Stupak, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jan. 16, 1978, Ser. No. 869,741
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **5 Claims**

1. A pH- and color-stabilized sterile aqueous antibiotic solution suitable for parenteral use consisting essentially of a parenterally acceptable salt of netilmicin and a parenterally acceptable carrier, said solution having a pH in the range of 5.0–7.0.

4,223,023

NONABSORBABLE LIPID BINDER

Ivan Furda, 16664 Meadowbrook La., Wayzata, Minn. 55391

Filed Oct. 12, 1978, Ser. No. 950,769
Int. Cl.[2] A61K *31/73;* **C08B** *37/08*
U.S. Cl. 424—180 **2 Claims**

1. A method of reducing lipid absorption in mammals which comprises orally administering to the mammal an amount of chitosan effective to substantially reduce the lipid absorption.

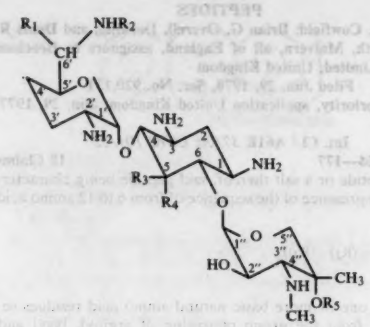
4,223,024

4″-O-ALKYLGENTAMICINS AND SAGAMICINS

James B. McAlpine, and Robert L. DeVault, both of Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 12, 1979, Ser. No. 19,982
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **44 Claims**

1. A compound selected from the group consisting of a 4″-O-alkylgentamicin and 4″-O-alkyl-sagamicin represented by the formula:



II

wherein R_1 is hydrogen or methyl: R_2 is hydrogen or methyl; R_3 is hydrogen or hydroxy; R_4 is hydroxy when R_3 is hydrogen and hydrogen when R_3 is hydroxy; and R_5 is loweralkyl; and the pharmaceutically acceptable salts thereof.

44. A pharmaceutical composition comprising an anti-bacterially effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier or diluent.

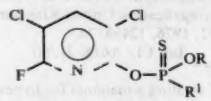
4,223,025

6-FLUORO-3,5-DICHLORO-2-PYRIDINYL PHOSPHORUS COMPOUNDS

Raymond H. Rigterink, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

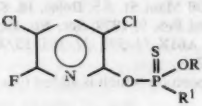
Filed Dec. 1, 1978, Ser. No. 965,545
Int. Cl.[2] C07F *9/58;* **A01N** *9/36*
U.S. Cl. 424—200 **10 Claims**

1. A compound corresponding to the formula



wherein R represents alkyl of 1 to 4 carbon atoms and R^1 represents OR, amino or mono- or dialkylamino wherein each alkyl group is of 1 to 4 carbon atoms.

6. A composition useful for the kill and control of soil insects which comprises an insecticidally-effective amount of a compound corresponding to the formula



wherein R represents alkyl of 1 to 4 carbon atoms and R^1 represents OR, amino or mono- or dialkylamino wherein each alkyl group is of 1 to 4 carbon atoms, in admixture with a chemically inert adjuvant therefor.

4,223,026
INSECTICIDAL SYNERGISTIC MIXTURE OF O,O-DIETHYL O-(3,5,6-TRICHLORO-2-PYRIDINYL)PHOSPHOROTHIOATE AND O-ETHYL O-(2-CHLORO-4-BROMOPHENYL)-S-N-PROPYL PHOSPHOROTHIOATE

Larry L. Larson, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 23, 1979, Ser. No. 23,515
Int. Cl.[2] A01N 9/36
U.S. Cl. 424—200 6 Claims

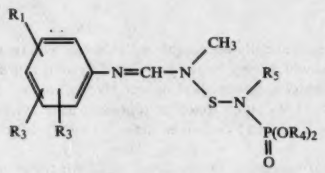
1. A synergistic insecticidal composition which comprises an inert carrier and a mixture of toxicants consisting essentially of about 1 part by weight of O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl)phosphorothioate and from about 1/66 to about 8 parts by weight of O-ethyl O-(2-chloro-4-bromophenyl)-S-n-propyl phosphorothioate.

4,223,027
PHENYLFORAMIDINES AND PESTICIDAL METHODS USING SAME

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 853,924, Nov. 22, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,315
Claims priority, application Switzerland, Nov. 30, 1976, 15055/76; Jun. 16, 1977, 7405/77; Oct. 6, 1977, 12209/77
Int. Cl.[2] A01N 9/36; C07F 9/24
U.S. Cl. 424—211 11 Claims

1. A phenylformamidine of the formula



wherein

R_1 is in the 2-position,

R_1 and R_2 each represent C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen;

R_3 represents hydrogen;

R_4 represents methyl or ethyl; and

R_5 represents C_1–C_8-alkyl or C_3–C_6-cycloalkyl.

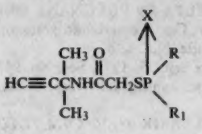
11. A method for combating insects and acarids which comprises applying to the locus thereof an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,223,028
BUTYNYLAMIDE PHOSPHATE AND PHOSPHONATES AND METHOD FOR CONTROLLING INSECTS

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 30, 1979, Ser. No. 34,528
Int. Cl.[2] A01N 9/36; C07F 9/165, 9/32
U.S. Cl. 424—211 27 Claims

1. A method of controlling insects or mites which comprises applying to the insects or mites or the locus thereof an insecticidally or miticidally effective amount of a compound having the formula



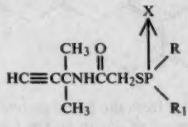
in which

X is selected from the group consisting of sulfur and oxygen;

R is selected from the group consisting of 1–4 carbon alkyl and 1–6 carbon alkoxy; and

R_1 is 1–6 carbon alkoxy.

10. A compound having the formula



in which

X is selected from the group consisting of sulfur and oxygen;

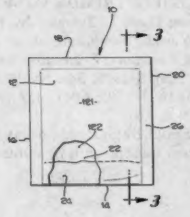
R is selected from the group consisting of 1–4 carbon alkyl and 1–6 carbon alkoxy; and

R_1 is 1–6 carbon alkoxy.

4,223,029
FABRIC SOFTENING PRODUCT AND METHOD OF USE IN DRYER

Darrell G. Mahler, and Charles Doumani, both of Los Angeles, Calif., assignors to Blue Cross Laboratories, North Hollywood, Calif.

Filed Jan. 15, 1976, Ser. No. 649,349
Int. Cl.[2] B05D 3/12; B65D 85/70
U.S. Cl. 427—242 10 Claims



10. Method of softening clothing and like fabric articles in a rotating drum dryer which includes (a) carrying along with the fabric articles tumbling in the drum a free-flowing particulate softening agent in a packet having moisture-permeable side walls and defining a freely tumbling locus of loose confinement therefor out of direct, physical contact with said articles, said agent yielding positive charges to the ambient moist air in said dryer upon contact of the agent surface with said air; and (b) passing moist air generated in the dryer through said packet in contact with said agent in tumbling induced different attitudes of agent particle repose within said locus responsive to drum rotation to condition said air by the addition thereto of positive charges of said softening agent, whereby said articles are softened by contact with the conditioned air.

4,223,030

NOVEL DELTA 4,9 PREGNANE DERIVATIVES

Max S. de Winter, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

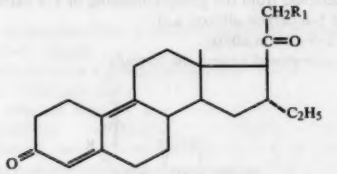
Filed Sep. 15, 1978, Ser. No. 942,594

Claims priority, application Netherlands, Sep. 26, 1977, 7710462

Int. Cl.[3] **A61K** *31/56;* **C07J** *17/00, 7/00*

U.S. Cl. 424—242 **11 Claims**

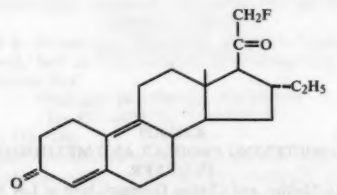
1. A compound of the formula:



wherein R_1 is selected from the group consisting of F, OH and OR_2, and R_2 is carbacyl of one to eighteen carbon atoms.

9. A method for preventing preganancy in humans, which comprises administering orally in unit dosage form a pharmaceutical composition comprising

(a) pharmaceutically effective amount of a compound of the formula:



and

(b) a pharmaceutically effective carrier.

4,223,031

AZOLOPYRIMIDINONES

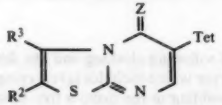
Robert R. Covington; Davis L. Temple, Jr., both of Evansville, and Joseph P. Yevich, Newburgh, all of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed May 5, 1978, Ser. No. 903,265

Int. Cl.[2] **A61K** *31/505;* **C07D** *513/04, 513/14*

U.S. Cl. 424—251 **18 Claims**

1. The 5H-thiazolo[3,2-a]pyrimidine having the following formula and the salts thereof with pharamaceutically acceptable bases



wherein

R^2 and R^3 are independently selected from H, the substituent A, or taken together with the carbon atoms to which they are attached denote cycloalkenyl having 5 to 7 ring members and up to 2 ring substituents, benzo, monosubstituted benzo, or di-substituted benzo wherein said substituents are independently defined by A, and

A is selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkanoyl, alkenoyl, alkylsulfonyl, alkylsulfinyl, alkylthio, alkanoamido, cycloalkyl having 3 to 6 ring members and 1 to 3 optional alkyl substituents, cycloalkylalkyl having 3 to 6 ring members and 1 to 3 optional alkyl substituents, wherein each of the foregoing groups has up to 8 carbon atoms, phenyl, phenylmethyl, trifluoromethyl, nitro, amino, hydroxyl, halogen, carbamoyl, cyano, and cyanoalkyl having from 2 to 4 carbon atoms;

Tet is 1H-tetrazol-5-yl; and

Z is O, S, or NH.

4,223,032

TRIAZOLO [4,5-B] QUINOLINES AND PROPHYLAXIS OF ALLERGIC DISEASES WITH THEM

Derek R. Buckle, Redhill, and Harry Smith, Maplehurst, Nr. Horsham, both of England, assignors to Beecham Group Limited, England

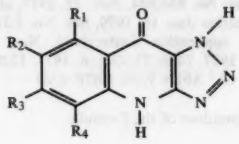
Filed Oct. 30, 1978, Ser. No. 955,599

Claims priority, application United Kingdom, Nov. 10, 1977, 46764/77

Int. Cl.[2] **A61K** *31/475;* **C07D** *471/14, 471/22*

U.S. Cl. 424—258 **6 Claims**

1. A compound of formula (I):



(I)

and pharamceutically acceptable salts thereof wherein R_1, R_2, R_3 and R_4 which may be the same or different, represent hydrogen, halogen, lower alkyl, lower alkoxy, or any adjacent two of R_1 to R_4 taken together represent an alkylene group containing from 3 to 5 carbon atoms or a 1,4-buta-1,3-dienylene group.

5. A pharmaceutical composition useful for the prophylaxis of allergic diseases comprising a compound according to claim 1 and a pharmaceutically acceptable carrier.

6. A method for the prophylaxis of allergic diseases which method comprises administering to a patient an effective amount of a compound according to claim 1.

4,223,033

SUBSTITUTED PYRIDINE METHYL ESTERS OF NAPHTHYL ACIDS

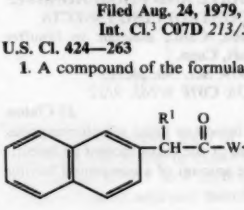
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Aug. 24, 1979, Ser. No. 69,446

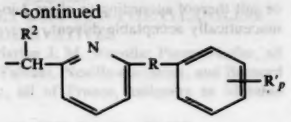
Int. Cl.[3] **C07D** *213/55;* **A61K** *31/44*

U.S. Cl. 424—263 **21 Claims**

1. A compound of the formula:



-continued



wherein,

R is oxygen, sulfur, methylene or carbonyl;

R′ is fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio;

p is zero, one or two;

W is oxygen or sulfur;

R^1 is lower alkyl of 2 to 5 carbon atoms; and

R^2 is hydrogen, cyano, ethynyl, methyl or trifluoromethyl.

18. A process for the control of pests selected from insects of the order Lepidoptera, Orthoptera, Heteroptera, Homoptera, Diptera, Coleoptera and Hymenoptera; mites of the family Tetranychidae; and ticks of the family Ornithodoros which comprises applying to the locus of the pest a compound according to claim **1**, in a pesticidally effective amount, and a suitable liquid or solid carrier.

4,223,034

ANILINE DERIVATIVES

Michael S. Hadley, Sawbridgeworth, England, assignor to Beecham Group Limited, England

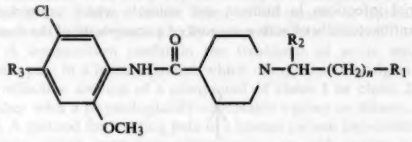
Filed Apr. 10, 1978, Ser. No. 894,942

Claims priority, application United Kingdom, Apr. 22, 1977, 16765/77

Int. Cl.² A61K *31/445;* C07D *211/62*

U.S. Cl. 424—267 **47 Claims**

1. A compound of the formula:

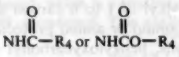


and the N-oxides and the pharmaceutically acceptable salts thereof wherein

R_1 is phenyl unsubstituted or substituted by fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 is hydrogen, nitro, amino,



in which R_4 is alkyl of 1 to 4 carbon atoms unsubstituted or substituted with up to three chlorine atoms or with three fluorine atoms on the same carbon atom; and

n has a value of 0, 1 or 2.

4,223,035

TREATING PROSTATE HYPERTROPHY WITH 4-(4H-BENZO[4,5]CYCLOHEPTA[1,2-B]THIOPHEN-4-YLIDENE)-1-METHYLPIPERIDINES

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

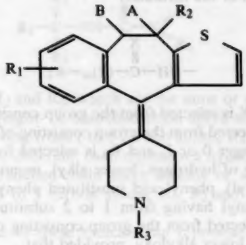
Continuation of Ser. No. 768,716, Feb. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 602,121, Aug. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 511,627, Oct. 3, 1974, abandoned. This application Jul. 24, 1978, Ser. No. 927,540

Claims priority, application Switzerland, Oct. 8, 1973, 14308/73

Int. Cl.² A61K *31/445;* C07D *409/08*

U.S. Cl. 424—267 **5 Claims**

1. A method of treating prostate hypertrophy in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula



wherein

R_1 is hydrogen, chlorine or lower alkyl,

R_2 is lower alkyl,

R_3 is lower alkyl, each of

A and B is hydrogen, or

A and B together form a bond,

or a pharmaceutically acceptable acid addition salt thereof.

4,223,036

1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-1,2,4-TRIAZOLES

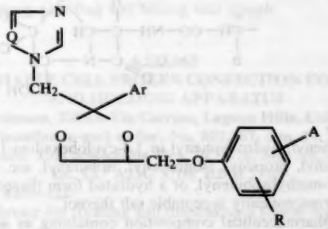
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 853,728, Nov. 21, 1977, Pat. No. 4,144,346, which is a continuation-in-part of Ser. No. 764,263, Jan. 31, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,612

Int. Cl.² C07D *249/08;* A61K *31/41*

U.S. Cl. 424—269 **3 Claims**

2. A composition for combatting a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Q is N;

Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl being phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

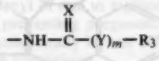
the radical A is a member selected from the group consisting of

(a) an isothiocyanato group —N=C=S;

(b) an amino radical of the formula

wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen and lower alkyl;

(c) a radical of the formula



wherein X is selected from the group consisting of O and S, Y is selected from the group consisting of O and NH, m is the integer 0 or 1, and R_3 is selected from the group consisting of hydrogen, lower alkyl, mono- and dihalo(lower alkyl), phenyl and substituted phenyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy, provided that:

(i) when said X is S, then said Y is NH and said m is 1, and

(ii) when said Y is O and said m is 1, then said R_3 is other than hydrogen; and

R is a member selected from the group consisting of hydrogen and nitro, provided that when said R is nitro, then said A is amino.

4,223,037

β-LACTAM ANTIBIOTICS AND THEIR USE

Michael Preiss, and Karl G. Metzger, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

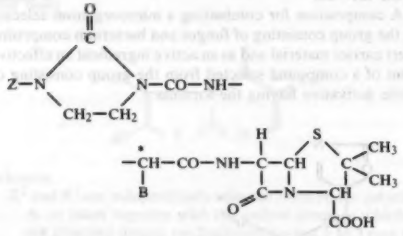
Filed Apr. 26, 1978, Ser. No. 900,402

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720579

Int. Cl.² A61K *31/43*; C07D *499/68*

U.S. Cl. 424—271 **11 Claims**

1. A compound of the formula



in which

B is phenyl, hydroxyphenyl or 1,4-cyclohexadien-1-yl,

Z is vinyl, propenyl, isopropenyl, isobutenyl, sec.-butenyl, or 1-methylisobutenyl, or a hydrated form thereof,

or a pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition containing as an active ingredient an antibacterially effective amount of a compound or salt thereof according to claim 1 in admixture with a pharmaceutically acceptable diluent.

4,223,038

BICYCLIC β-LACTAM ANTIBIOTICS

Terence C. Smale, Epsom Downs, England, assignor to Beecham Group Limited, England

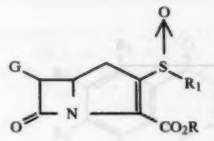
Filed Oct. 30, 1978, Ser. No. 955,598

Claims priority, application United Kingdom, Nov. 12, 1977, 47201/77

Int. Cl.² A61K *31/40*; C07D *487/04*

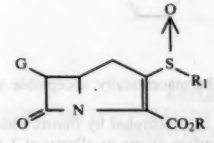
U.S. Cl. 424—274 **50 Claims**

1. A compound of the formula (I):



wherein G is hydrogen, R_1 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by hydroxy, amino or amino protected by by alkanoyl or 1 to 6 carbon atoms, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl; phenyl unsubstituted or substituted by one or more halogen alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino or amino protected by alkanoyl of 1 to 6 carbon atoms, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl, and R is alkyl of 1 to 6 carbon atoms, benzyl, p-nitrobenzyl, p-methoxybenzyl phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, phthalidyl, phthalimidomethyl, α-ethoxycarbonyloxyethyl or alkanoyloxymethyl of 1 to 6 carbon atoms.

15. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula:



wherein G is hydrogen, R_1 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by hydroxy, amino or amino protected by alkanoyl of 1 to 6 carbon atoms, benzyloxycarbonyl of p-nitrobenzyloxycarbonyl; phenyl unsubstituted or substituted by one or more halogen alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino or amino protected by alkanoyl of 1 to 6 carbon atoms, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl, and R is alkyl of 1 to 6 carbon atoms, benzyl, p-nitrobenzyl, p-methoxybenzyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, phthalidyl, phthalimidomethyl, α-ethoxycarbonyloxyethyl or alkanoyloxymethyl of 1 to 6 carbon atoms.

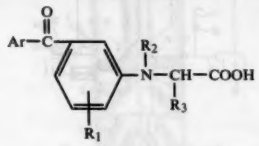
4,223,039

THERAPEUTICALLY USEFUL N-PHENYLANILINE DERIVATIVES

Francis E. E. Rose; Christian J. M. Warolin; Pierre Muller, all of Paris; Paul M. P. Fabinni, Neuilly-sur-Seine, and Bernard Gaudilliére, Nanterre, all of France, assignors to Metabio Joullie, France

Filed Mar. 14, 1979, Ser. No. 20,358
Claims priority, application France, Mar. 15, 1978, 78 07443
Int. Cl.[2] C07C *101/447;* A61K *31/195, 31/38*
U.S. Cl. 424—275 10 Claims

1. Compounds of the formula



(I)

in which

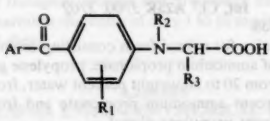
Ar is selected from the group consisting of phenyl, halophenyl, lower-alkylphenyl, and thienyl,

R_1 is selected from the group consisting of hydrogen, halogen, and lower-alkyl,

R_2 is selected from the group consisting of hydrogen, lower-alkyl, acetyl, benzoyl, and p-chlorobenzoyl, and

R_3 is selected from the group consisting of hydrogen, lower-alkyl, and phenyl in the form of racemates or optical isomers, and physiologically-acceptable salts thereof.

2. Compounds of the formula



(I)

in which

Ar is selected from the group consisting of phenyl, halophenyl, lower-alkylphenyl, and thienyl,

R_1 is selected from the group consisting of hydrogen and halogen,

R_2 is selected from the group consisting of hydrogen, lower-alkyl, acetyl, benzoyl, and p-chlorobenzoyl, and

R_3 is selected from the group consisting of hydrogen, lower-alkyl and phenyl, in the form of racemates or optical isomers, and physiologically-acceptable salts thereof.

9. A composition useful in the treatment of acute and chronic pain in a human patient which comprises an analgesically-effective amount of a compound of claim 1 or claim 2, together with a physiologically-acceptable carrier or diluent.

10. A method for treating pain in a human patient experiencing pain which comprises administering to said patient an analgesically-effective amount of a compound of claim 1 or claim 2.

4,223,040

LAURIC ACID FOR THE PREVENTION AND TREATMENT OF MYCOBACTERIAL DISEASES

John M. Carroll, 1421 Royal St., Kissimmee, Fla. 32741

Continuation-in-part of Ser. No. 230,115, Feb. 28, 1972, abandoned, which is a continuation of Ser. No. 844,162, Jul. 23, 1969, abandoned. This application Nov. 26, 1974, Ser. No. 527,359
Int. Cl.[2] A61K *31/20*
U.S. Cl. 424—318 4 Claims

1. A method for treating diseases caused by Mycobacterium species selected from the group consisting of *M. tuberculosis* and *M. paratuberculosis* in mammals which comprises orally administering to mammals in need of said treatment, at regular intervals, an effective dose of lauric acid.

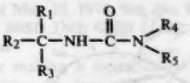
4,223,041

UREA DERIVATIVES TO TREAT ANXIETY AND AGGRESSIVITY

Charles Pigerol, Saint-Ouen; Pierre Eymard, Fontaine; Jean-Claude Vernieres, Domene; Madeleine Combet epse Broll, St. Egreve, and Jean-Yves Lacolle, Domene, all of France, assignors to Labaz, Paris, France

Filed Oct. 25, 1977, Ser. No. 844,618
Claims priority, application France, Nov. 4, 1976, 76 33213
Int. Cl.[2] A61K *31/17*
U.S. Cl. 424—322 3 Claims

1. A method of treating pathological states of anxiety and aggressivity in a host in need of such treatment, comprising the administration to said host of an effective dose of at least one urea derivative of the general formula:



I

wherein R_1, R_2 and R_3, which are the same or different, each represent a straight- or branched-chain alkyl, alkenyl or alkynyl radical having from 1 to 5 carbon atoms, R_4 and R_5 which are the same or different, each represent a hydrogen atom or a straight- or branched-chain alkyl, alkenyl or alkynyl radical having from 1 to 5 carbon atoms, R_1, R_2 and R_3 being such that:

(a) only one of these radicals can represent an alkenyl or alkynyl group having an unsaturated bond in the α, β-position with respect to the methylurea radical, in this case, each of the other two substituents represents an alkyl radical,

(b) the sum of their carbon atoms is never inferior to 4.

4,223,042

PREPARATION OF YEAST LEAVENED DOUGH PRODUCTS

George P. Sternberg, 727 W. 46th St., Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 712,721, Aug. 9, 1976, Pat. No. 4,093,749, which is a continuation-in-part of Ser. No. 525,359, Nov. 20, 1974, abandoned. This application Mar. 13, 1978, Ser. No. 885,812
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] A21D *2/04, 2/14*
U.S. Cl. 426—20 17 Claims

1. A method of making a yeast leavened dough product comprising the steps of:

mixing dough ingredients consisting of flour, water, yeast, a starch digesting agent, salt, sugar, shortening, milk, a yeast nutrient and monosodium glutamate, said monosodium glutamate added in the amount of 0.001 to 0.010 percent by weight of the flour content;

relaxing said dough at the completion of said mixing step; and

machining, proofing and baking said dough.

4,223,043

DETACHABLE CELL FROZEN CONFECTION FORMING AND HOLDING APPARATUS

Oliver Johnson, 3309A Via Carrizo, Laguna Hills, Calif. 92653

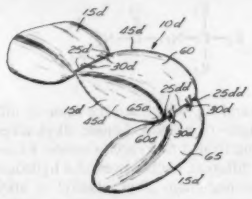
Continuation-in-part of Ser. No. 807,367, Jun. 17, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,786
Int. Cl.[2] A23G *9/00;* B28B *7/06*
U.S. Cl. 426—122 6 Claims

1. A device for forming and dispensing a frozen liquid comprising:

a tube of flexible material containing a freezable liquid having upper and lower walls, one end of said tube having entrance means for permitting the filling of said tube with liquid in an unfrozen state, the other end of said tube being sealed; and

plural constriction-forming means in said tube at spaced intervals along the length thereof, for (i) dividing said tube longitudinally into a single line of a plurality of discrete cells connected exclusively in an extended arrangement, (ii) permitting the passage of unfrozen liquid into all of said cells from said entrance means, and (iii) facilitating the detachment of an individual cell from said tube when said liquid is frozen therein, while maintaining the structural integrity of the detached cell and the remaining cells in said tube, said freezable liquid being contained in said cells;

said constriction-forming means each comprising an interrupted weld line having a liquid passage gap therein and



disposed laterally across said tube, said weld line constricting said tube upon the freezing expansion of liquid in each cell so that said tube is easily broken at said weld line for detachment of a first expanded cell from a second expanded cell by stress along said weld line resulting from the leverage applied by the impingement of said first and second cells against one another when said tube is bent along said weld line;

said interrupted weld line remaining intact along both said first and second cells when said first cell is detached from said second cell;

each of said detached cells providing a container for the frozen liquid contained therein, said liquid passage gap providing a weakened end for said container along the weld line at which said cell was detached, said weakened end providing a means for dispensing said frozen liquid when pressure is applied to said container; and means for closing said entrance means.

4,223,044

METHOD FOR BREAKING A BRIDGE OF PARTICULATE AND GROUND SUBSTANCES

Tsuneyuki Se, Fukuoka, Japan, assignor to Marubeni Corporation, Higashi and Japan Fumigation Development Co., Ltd., Osaka, both of, Japan

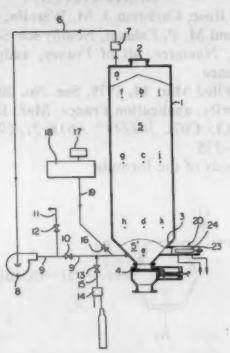
Filed May 19, 1978, Ser. No. 907,775

Claims priority, application Japan, Jul. 26, 1977, 52-90077; Dec. 9, 1977, 52-148393

Int. Cl.[3] **A01F** *25/20;* **B65D** *88/70*

U.S. Cl. 426—318 **13 Claims**

1. A method of breaking a bridge of particulate and ground substances in a storage vessel containing said substances, comprising the steps of closing said storage vessel containing gas and said substances, removing interior gas from the upper part of said vessel to reduce internal pressure of the vessel to between 360 and 20 mmHg absolute, and while the interior of said vessel is still at said reduced pressure directly impacting the substances forming said bridge from below with inert gas, without the intermediary of a liner between said bridge substances and said inert gas, by suddenly introducing said inert gas under a pressure of between atmospheric and 10 kg/cm^2



into said vessel below the bridge to break said bridge by said direct impacting.

4,223,045

PRESERVATIVE FOR ANIMAL FEEDS

Fritz Fink, Limburgerhof, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 833,060, Sep. 14, 1977, abandoned. This application Jan. 25, 1979, Ser. No. 6,529

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644351

Int. Cl.[3] **A23K** *3/00, 3/02*

U.S. Cl. 426—335 **2 Claims**

1. A preservative for animal feeds consisting essentially of a liquid mixture of ammonium propionate, propylene glycol and water, having from 20 to 30 weight percent water, from 44.2 to 64.6 weight percent ammonium propionate and from 5.4 to 29.5 weight percent propylene glycol.

4,223,046

FLAVORING WITH CARVYL METHYL ETHER

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 939,897, Sep. 5, 1978, Pat. No. 4,163,068, which is a division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687. This application Feb. 16, 1979, Ser. No. 12,798

Int. Cl.[2] **A23L** *1/226*

U.S. Cl. 426—538 **1 Claim**

1. A root beer beverage comprising 0.5 ppm of carvyl methyl ether whereby the woody, rooty aroma and taste notes of said root beer are augmented and enhanced.

4,223,047

METHOD OF DEPOSITING A PROTECTIVE SURFACE LAYER ON A VERY THIN METAL SHEET

Werner Pappert; Ulrich Tenhaven, and Friedrich Woiff, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 923,781

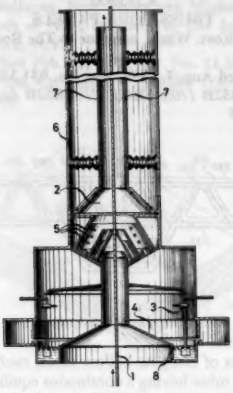
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732009

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 427—32 **11 Claims**

1. A method of electrostatically depositing in a coating apparatus an oil containing corrosion protective surface layer on a very thin metal sheet which is in the form of a band for

foodstuff packaging purposes without degreasing for lacquering, welding and printing, which method includes in combination the steps of: moving said band through said apparatus at a high band speed of up to 600m/min; coating said band by electrostatically depositing thereon only a pre-ionized mixture consisting of 1 to 2 parts of an ester of an acid selected from the group consisting of sebacic acid, axelaic acid, and citric acid,



and one part of a high molecular acid having the general formula $CH_3\ (CH_2)_n\ CON\ (CH_3)\ CH_2COOH$; and forming said coating by electrostatically depositing in a layer having a uniformly thin though adequate corrosion protective film for periods of transport, storage and processing having a physiologically harmless thickness of only 1 to 10 mg/m^2 of surface of said metal sheet.

4,223,048

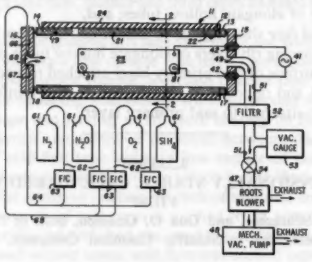
PLASMA ENHANCED CHEMICAL VAPOR PROCESSING OF SEMICONDUCTIVE WAFERS

George M. Engle, Jr., San Jose, Calif., assignor to Pacific Western Systems, Mountain View, Calif.

Filed Aug. 7, 1978, Ser. No. 931,565

Int. Cl.[2] **C23C** *13/12;* **H01L** *21/443;* **B05D** *5/12*

U.S. Cl. 427—39 **15 Claims**



1. In a method of plasma enhanced chemical vapor processing of semiconductive wafers wherein an evacuable envelope contains first and second sets of interleaved electrodes one set being electrically insulated relative to the other for establishing an electrical plasma discharge within said evacuable envelope in the processing gaps between said interleaved electrodes, the steps of:

loading semiconductive wafers into the processing gaps between adjacent interleaved electrodes of said first and second sets with one major face of each wafer being disposed facing an adjacent electrode and the other major face of each wafer facing into the processing gap defined between adjacent ones of said first and second electrodes;

evacuating said envelope to subatmospheric pressure;

introducing a vapor at subatmospheric pressure into said envelope;

establishing an electrical plasma discharge at subatmospheric pressure in the processing gaps between said interleaved first and second sets of electrodes to produce chemically active vapor products of said plasma discharge; and

chemically interacting said chemically active vapor products with said major faces of said wafers which face into said processing gaps for processing of said wafers.

4,223,049

SUPERFICIALLY MIXED METAL OXIDE ELECTRODES

Royce W. Murray, Chapel Hill, N.C.; P. R. Moses, Windham, N.H., and Larry Wier, Schenectady, N.Y., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed May 23, 1978, Ser. No. 908,624

Int. Cl.[2] **B05D** *5/12;* **C25B** *11/00;* **C25C** *7/02*

U.S. Cl. 427—126 **12 Claims**

1. Process for making a superficially mixed metal oxide electrode comprising the steps of:

(a) coating a conductive base metal with an oxide of a film-forming metal to form a metal oxide electrode,

(b) immersing said metal oxide electrode of step (a) in a suitable solvent solution of a coordinately reactive salt of a noble metal, said metal having the ability to form an electrically conducting oxide,

(c) removing said metal/oxide electrode from said solvent solution of step (b) and washing said metal oxide electrode with distilled water or other suitable solvent, whereby any separate and distinct outer noble metal salt layer formed by said immersion has been removed, and

(d) heating said metal oxide electrode to form a superficially mixed oxide electrode.

4,223,050

PROCESS FOR EMBOSSING A RELIEF PATTERN INTO A THERMOPLASTIC INFORMATION CARRIER

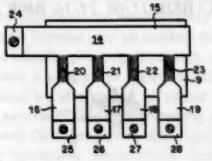
Alex Nyfeler, Barr, and David L. Greenaway, Oberwil, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Continuation of Ser. No. 775,775, Mar. 9, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,239

Claims priority, application Switzerland, May 4, 1976, 5549/76

Int. Cl.[2] **B29C** *17/00;* **B29D** *11/00*

U.S. Cl. 427—163 **9 Claims**



7. A method for embossing a high-resolution diffraction phase relief pattern into a thermoplastic information carrier, comprising:

coating the thermoplastic information carrier with a thin metallic layer;

placing the coated thermoplastic information carrier on a support member;

pressing a foil-shaped embossing matrix onto the coated thermoplastic information carrier by means of a punch, said embossing matrix having a diffraction phase relief

pattern on the surface which is pressed onto the coated thermoplastic information carrier;

heating the embossing matrix by passing an electric current impulse through said matrix while it is pressed onto the coated thermoplastic information carrier; and

maintaining the embossing matrix pressed onto the coated thermoplastic information carrier after the electric current has ceased, until the relief pattern embossed through said metallic layer in said thermoplastic information carrier has hardened.

4,223,051

DETACHABLE FINIAL LAMP PART

Jerome Warshawsky, Baldwin Harbor, N.Y., assignor to I. W. Industries, Inc., Melville, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,032
Int. Cl.[2] B44F *11/00*
U.S. Cl. 428—28 **2 Claims**

1. A detachable finial lamp part comprising a body of integral one-piece molded plastic construction and being formed with undercut sides and a base comprising;

(a) a bore molded into said body extending from the base surface thereof along an axis line; and

(b) screw threads molded into the surface of said bore to a limited extent thereof;

(c) said screw threads starting at a distance into said bore spaced from said base surface; wherein said base surface is integrally formed with at least one circular recess formed therein and being disposed about said bore.

4,223,052

SYNTHETIC RESIN MOLDING OR TRIM STRIP

Eiichi Tsuda, Nagoya, and Tomihiko Mizudani, Anjo, both of Japan, assignors to Inoue Gomu Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 7, 1978, Ser. No. 931,312
Claims priority, application Japan, Aug. 5, 1977, 52-93891
Int. Cl.[2] B32B *15/08, 27/36;* B60R *13/04*
U.S. Cl. 428—31 **5 Claims**

1. In a synthetic resin molding or trim strip prepared by adhering a metallic foil on, or embedding said foil in, the surface of a thermoplastic resin substrate, the synthetic resin molding or trim strip characterized in that the metallic foil and the resin substrate layer are integrally bonded by an adhesive of a transparent thermoplastic linear saturated polyester copolymer consisting of at least the following components:

(a) dibasic acids consisting of aromatic dibasic acids comprising 90 mol% or more and aliphatic dicarboxylic acids comprising the remainder of the dibasic acid components, 90 mol% or more of said aromatic dibasic acids being terephthalic acid; and

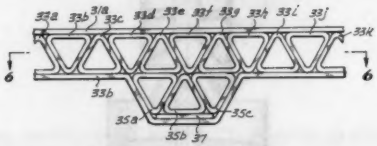
(b) glycols consisting of diethylene glycol and alkylene glycols having 6 or less carbon atoms, said diethylene glycol being 40 mol% or more of said glycols.

4,223,053

TRUSS CORE PANELS

Joseph Brogan, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 7, 1978, Ser. No. 931,325
Int. Cl.[2] B32B *1/08;* E04C *3/16;* B32B *3/12, 3/20*
U.S. Cl. 428—35 **6 Claims**



1. A stiffened truss core panel comprising:

a first face sheet;

a primary layer of elongate hollow tubes, each of said elongate hollow tubes having a continuous equilateral triangular cross-sectional shape, said elongate hollow tubes being positioned side-by-side such that two alternating sets of tubes are formed, the bases of one of said alternating sets and the apices of the other of said alternating sets adjoining said first face sheet and being affixed thereto;

at least one reinforcing rib layer of elongate hollow tubes affixed to a selected region of said primary layer of elongate hollow tubes on the side thereof remote from the side affixed to said first face sheet, each of said elongate hollow tubes having a continuous equilateral triangular cross-sectional shape, said elongate hollow tubes being positioned side-by-side such that two alternating sets of tubes are formed, the bases of one of said alternating sets of tubes and the apices of the other of said alternating sets of tubes of said rib layer adjoining the apices of said one of said alternating sets of tubes and the bases of said other of said alternating sets of tubes of said primary layer, the longitudinal axes of said reinforcing rib layer of elongate hollow tubes lying parallel to the longitudinal axes of said primary layer of elongate hollow tubes; and,

a second face sheet affixed to the surface of said primary and reinforcing rib layers of elongate hollow tubes opposed to the surface of said primary layer attached to said first face sheet and opposed to the surface of said reinforcing rib layer attached to said primary layer.

4,223,054

DIMENSIONALLY STABLE, CALENDERED VINYL FILM

Kurt M. Schramer, and Don O. Ocampo, both of Newburgh, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 796,275, May 12, 1977, abandoned, which is a division of Ser. No. 667,223, Mar. 15, 1976, Pat. No. 4,124,431. This application Nov. 16, 1978, Ser. No. 961,427
Int. Cl.[2] B32B *27/10*
U.S. Cl. 428—40 **6 Claims**

1. A substantially dimensionally stable, calendered vinyl film construction, having a maximum shrinkage of about 0.3%, suitable for use as an outdoor marking film which comprises:

(a) a calendered plasticized vinyl film containing from about 50% to about 72%, by weight, vinyl chloride resin;

(b) a layer of an acrylic adhesive having a high creep resistance of in excess of about 1000 minutes and a high shrink-

age resistance of less than about 0.4% on one surface of said vinyl film; and

(c) release paper attached to the adhesive on the side remote from the vinyl film.

4,223,055

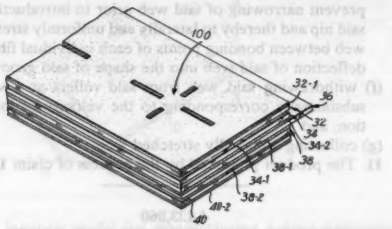
MULTI-LAYER GRAPHIC ARTS TAPE SYSTEM

James M. Castelluzzo, New York, and Michael I. Rackman, Brooklyn, both of N.Y., assignors to TM Invention Associates, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,148

Int. Cl.² B32B *3/10*; C09J *7/02*

U.S. Cl. 428—40 **12 Claims**



1. A multi-layer graphic arts tape system comprising a first opaque tape having an adhesive coating on a first surface thereof, a second opaque tape having a first surface in facing relationship with the second surface of said first tape and having an adhesive coating on the second surface thereof, a separator strip having a first surface in facing relationship with said second surface of said second tape, a third opaque tape having an adhesive coating on a first surface thereof in facing relationship with the second surface of said separator strip, said separator strip containing holes therein for allowing said adhesive coatings on said second surface of said second tape and said first surface of said third tape to adhere to each other in the regions of said holes, an adhesive disposed between said second surface of said first tape and said first surface of said second tape and having a bonding force which is less than that provided by the adhesive coating on each of said first and second tapes when each of said tapes is applied to an application surface, and a plurality of punched-out markings extending through said first, second and third tapes and said separator strip.

7. A two-layer graphic arts tape system for use with artwork sheets comprising a first opaque tape having an adhesive coating on a first surface thereof, a second opaque tape having a first surface in facing relationship with the second surface of said first tape and having an adhesive coating on the second surface thereof, an adhesive disposed between said second surface of said first tape and said first surface of said second tape and having a bonding force which is less than that provided by the adhesive coating on each of said first and second tapes when each of said tapes is applied to an artwork sheet, and a plurality of punched-out markings extending through said first and second tapes, said first and second tapes having colors which contrast with those of said artwork sheets.

4,223,056

WEIGHTED SERVICE CLOTH

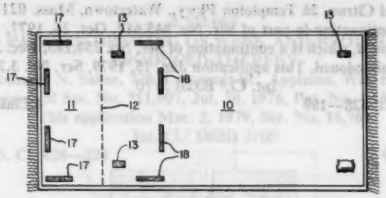
Antonio Di Fronzo, 8633 N. Keystone, Skokie, Ill. 60076

Filed Feb. 22, 1979, Ser. No. 14,067

Int. Cl.² A41D *31/02*; B65D *81/00*; B32B *33/00*

U.S. Cl. 428—52 **3 Claims**

1. A service cloth having patches of hook fiber cloth secured to the service cloth on its top side, bags containing weights, each of said bags having secured thereto on one side thereof a patch of hook fiber cloth, the hook fibers of the cloth on said bag being detachably engaged in hooked relation with the



hook fibers of the cloth of said patches whereby said bags are detachably secured to the service cloth.

4,223,057

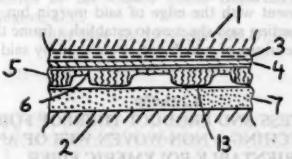
SIMULTANEOUS TRANSFER PRINTING AND EMBOSSING OR SURFACE TEXTURING METHOD, AND EMBOSSING MEMBER FOR USE THEREIN

Thomas Rejto, 19 Homestead Rd., Greenwich, Conn. 06830

Division of Ser. No. 759,887, Jan. 17, 1977, Pat. No. 4,049,374, which is a continuation-in-part of Ser. No. 597,562, Jul. 21, 1975, abandoned. This application May 16, 1977, Ser. No. 797,542

Int. Cl.² B32B *3/10, 3/30*

U.S. Cl. 428—138 **5 Claims**



1. A sheet, having ends, used as embossing member in the simultaneous embossing and heat transfer printing of fabrics containing thermoplastic fibers, said sheet comprising a heat resistant material with practically no affinity or permanent retention properties for vaporizable or sublimable dyes used in the process, but being permeable to vapors and/or gases of these dyes, the free circulation of the vapors and gases through the sheet being considerably improved by a sufficiently loose and/or porous construction, which construction makes it however insufficiently inert and/or insufficiently resistant to mechanical stress to be formed into an endless belt for service on a continuous heat transfer printing apparatus, said sheet having in at least one face a pattern in relief the three dimensional effect being created by alternation of raised and hollow portions and/or by apertures said pattern being permanently embossed in relief into the fabric to be decorated during the heat transfer printing operation, distinctively from the pattern in color transferred simultaneously without substantial alteration into the fabric from said sheet which being united with a temporary dye-bearing organ or being a unitary printing-embossing sheet, stores, already before its use on a heat transfer printing apparatus, in a dried state, highly volatile and penetrant sublimable and/or vaporizable dye in sufficient quantity to color at least one fabric during the simultaneous embossing and heat transfer printing process executed at a 340°–430° F. temperature range, corresponding to the softening point of the fabric to be decorated as well as to the vaporization or sublimation temperature of the dye.

4,223,058

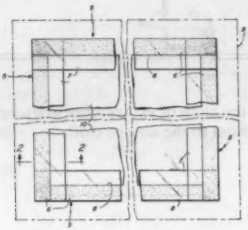
MATERIAL FOR USE IN FRAMING PICTURES AND DOCUMENTS

Samuel Citron, 26 Templeton Pkwy., Watertown, Mass. 02172

Continuation-in-part of Ser. No. 845,617, Oct. 26, 1977, abandoned, which is a continuation of Ser. No. 754,183, Dec. 27, 1976, abandoned. This application Jan. 15, 1979, Ser. No. 3,216

Int. Cl.[2] **B32B** *3/10*

U.S. Cl. 428—189 **4 Claims**



1. A tape for use in attaching a sheet to a surface, said tape including an adhesive coat on one face that extends the full length thereof and from one edge part way across said one face with the uncoated portion of said one face to overlie a margin of said sheet, said adhesive colored and disposed to establish a straight and continuous demarcation between the coated and uncoated portions of said one face that parallels the edges of said tape, said tape at least sufficiently translucent to enable said adhesive portion to be observed through said tape thus to enable said tape to be applied against the surface along a margin of the sheet with the inner edge of the adhesive substantially in abutment with the edge of said margin but without adhesive contacting said sheet or to establish a frame the sheet receiving dimensions of which are established by said lines.

4,223,059

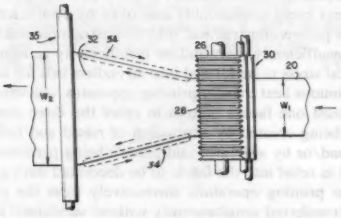
PROCESS AND PRODUCT THEREOF FOR STRETCHING A NON-WOVEN WEB OF AN ORIENTABLE POLYMERIC FIBER

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Biax Fiberfilm Corporation, Neenah, Wis.

Continuation of Ser. No. 563,623, Mar. 31, 1975, abandoned. This application Apr. 27, 1978, Ser. No. 900,720

Int. Cl.[2] **B29C** *17/02;* **D04H** *3/12;* **D06C** *3/06*

U.S. Cl. 428—198 **12 Claims**



10. A process for biaxially stretching a non-woven web of thermoplastic orientable polymeric fibers to thereby improve the strength of the web which comprises:

(a) introducing said web into a nip of interdigitating rollers having grooves substantially parallel to the axis of said rollers, the distance between grooves being less than one millimeter times the web basis weight in grams per square meter;

(b) controlling the velocity of introduction of said web into said nip to assume and maintain the velocity substantially identical to the surface velocity of said rollers to prevent slipping of said web and thereby longitudinally and uniformly stretch said web between bonding points of each individual fiber by a deflection of said web into the shape of said grooves;

(c) withdrawing said web from said rollers at a velocity greater than the rotational velocity of said rollers;

(d) introducing said web into a nip of interdigitating rollers having grooves substantially perpendicular to the axis of said rollers, the distance between grooves being less than one millimeter times the web basis weight in grams per square meter;

(e) controlling the velocity of introduction of said web into the said nip to assume and maintain the velocity substantially identical to the surface velocity of said rollers to prevent narrowing of said web prior to introduction into said nip and thereby to laterally and uniformly stretch said web between bonding points of each individual fiber by a deflection of said web into the shape of said grooves;

(f) withdrawing said web from said rollers at a velocity substantially corresponding to the velocity of introduction; and

(g) collecting a biaxially stretched web.

11. The product produced by the process of claim **10**.

4,223,060

PRESSURE-SENSITIVE COPYING PAPER

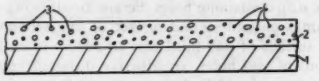
Paul R. Raine, Cardiff, and Lawrence Westcott, Cefn Cribwr Nr. Bridgend, both of Wales, assignors to Wiggins Teape Limited, Hampshire, England

Division of Ser. No. 758,857, Jan. 12, 1977, Pat. No. 4,165,398. This application Dec. 1, 1978, Ser. No. 965,435

Claims priority, application United Kingdom, Jan. 19, 1976, 3031/76

Int. Cl.[2] **B41M** *5/12, 5/16*

U.S. Cl. 428—199 **27 Claims**



1. Pressure-sensitive copying material comprising a sheet material on which is a layer of a coating composition comprising:

(a) microcapsules containing a solution of a colourless colour former,

(b) particular mineral colour developing material which has been chemically treated with a protective agent in an amount less than about 10% based on the weight of said particulate mineral colour developing material and which is effective in inhibiting premature colour development, said protective agent being characterized as being compatible with said microcapsules and by being substantially non-interfering with the colour-developing properties of said colour developing material, and

(c) binder.

14. Pressure-sensitive copying material comprising a sheet material on which is a layer of a coating composition comprising:

(a) microcapsules containing a solution of a colourless colour former, said microcapsules having been chemically treated with a first protective agent,

(b) particulate mineral colour developing material which has been chemically treated with a second protective agent, and

(c) a binder,

wherein said first and second protective agents are present in an amount which is less than about 10% based on the total weight of said particulate mineral colour developing material and the dry weight of said microcapsules, said amount being

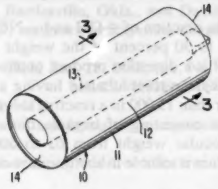
effective in inhibiting premature colour development, said first and second protective agents being characterized by being compatible with said microcapsules and by being substantially non-interfering with the colour-developing properties of said colour developing material.

4,223,061

HYDROPHILIC LAMINATE USEFUL FOR MAKING DISPENSING DEVICE

Alan S. Michaels, San Francisco, assignor to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 25, 1977, Ser. No. 844,968
Int. Cl.² B32B *7/00*
U.S. Cl. 428—215 **1 Claim**



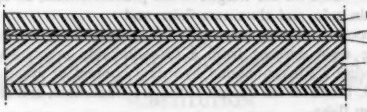
1. A laminate useful for manufacturing a drug dispensing device wherein the laminate comprises a first lamina 0.5 mm to 50 mm thick and formed of a member selected from the group consisting of wool, cotton, felt, straw, flax and paper laminated to a second lamina 2 mm to 50 mm thick and formed of a member selected from the group consisting of poly(N-vinyl-2-pyrrolidone), methylcellulose cross-linked with a dialdehyde, a mixture of agar and sodium carboxymethylcellulose, a water-insoluble, water-swellable copolymer produced by forming a dispersion of finely divided copolymer of maleic anhydride with styrene, ethylene, propylene, butylene, or isobutylene cross-linked with from about 0.001 to about 0.5 moles of a polyunsaturated cross-linking agent per mole of maleic anhydride in the copolymer, and water-swellable polymers of N-vinyl lactams, said second lamina being selected such that in the presence of a biological fluid, a 5 to 50 fold increase in volume occurs.

4,223,062

CURL RESISTANT PHOTOPLASTIC FILM

Francis P. Hession, Blue Point, N.Y., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 15, 1978, Ser. No. 960,963
Int. Cl.² G01D *15/02*
U.S. Cl. 428—216 **5 Claims**



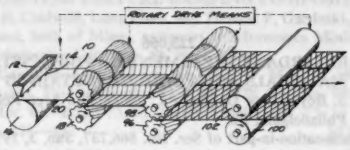
1. A transmissively readable photoplastic film having a base ply of flexible transparent polyester material to one side of which is laminated, in sequence, a light transmissive layer of electrically conductive particles, a primer for aiding bonding, and a photoplastic layer, and to the other side of which is laminated a layer of a different polymeric material of sufficient thickness and physical properties to prevent significant curl of the film, said photoplastic layer having a thickness of about 17 to 18 microns and containing an intermediate molecular weight styrene polymer having a softening range above 116° C. but below the softening point of said base ply material, a modifying constituent, and an effective amount of copper phthalocyanine, said layer of a different polymeric material having a thickness of about 4 to 6 microns and consisting essentially of a solvent deposited methyl methacrylate polymer.

4,223,063

PATTERN DRAWING OF WEBS, AND PRODUCT PRODUCED THEREBY

Reinhardt N. Sabee, 728 S. Summit St., Appleton, Wis. 54911

Division of Ser. No. 711,007, Jul. 30, 1976, Pat. No. 4,153,664. This application Mar. 2, 1979, Ser. No. 16,764
Int. Cl.² D03D *3/00*
U.S. Cl. 428—224 **8 Claims**



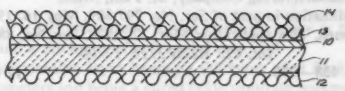
1. A fabric having spaced apart sets of substantially undrawn quadrilateral areas, said quadrilateral areas lying in lines at an angle to the machine direction axis of the web, said undrawn quadrilateral areas bounded on two parallel sides by areas axially drawn parallel to angle A and bounded on the remaining sides by areas axially drawn normal to angle A.

4,223,064

ALKALI METAL PROTECTIVE GARMENT AND COMPOSITE MATERIAL

John L. Ballif, III, Salt Lake City, Utah, and Wei W. Yuan, Seattle, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 10, 1979, Ser. No. 37,971
Int. Cl.² B32B *15/04, 17/02*
U.S. Cl. 428—246 **6 Claims**



1. A heat resistant material adapted to be incorporated in protective articles exposed to a spray of molten alkali metal, comprising:

a continuous outer layer of nickel foil;

a continuous layer of woven ceramic fiber fabric completely overlying a first surface of the layer of nickel foil;

and a continuous layer of thermal insulation completely underlying a second surface of the layer of nickel foil; and means securing the underlying and overlying layers to the layer of nickel foil.

4,223,065

ANTI-GRAYING FABRICS OF SYNTHETIC POLYESTER FIBERS AND PROCESS FOR PRODUCING SAME

Kunio Amemiya, Kyoto; Motohiro Nishimura, Uji, and Yoichi Kimura, Joyo, all of Japan, assignors to Unitika Ltd, Hyogo, Japan

Filed Oct. 30, 1978, Ser. No. 955,919
Claims priority, application Japan, Nov. 8, 1977, 52-134442; Aug. 16, 1978, 53-100324
Int. Cl.² D06M *15/12, 15/66*
U.S. Cl. 428—272 **6 Claims**

1. A process for producing an anti-graying fabric of synthetic polyester fiber by applying to the fabric an aqueous solution, aqueous dispersion or emulsion comprising in mixture a polysiloxane resin comprising dimethyl polysiloxane having

a hydroxyl group attached directly to a terminal silocon atom or methylhydrogen polysiloxane or a mixture of the polysiloxanes, a melamine resin consisting of an alkyletherified methylolmelamine resin, and an antistatic agent consisting of a metal salt or phosphoric acid ester which is easily removable by dry cleaning, thereafter drying the fabric and heat-treating the resulting fabric.

4,223,066

FIRE RETARDANT TREATMENT OF FIRE UNSTABLE MATERIALS AND PRODUCTS OBTAINED

Robert J. Boyle, New Galilee, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 866,737, Jan. 3, 1978, abandoned. This application May 23, 1979, Ser. No. 41,665

Int. Cl.[2] **B32B** *3/26*

U.S. Cl. 428—306 **10 Claims**

1. A fire and heat resistant structure comprising a strata of fire unstable material having an intumescent fire retardant composition in powdered form injected into at least one major surface of such strata for an appreciable depth at a pressure sufficiently low to preclude any appreciable impairment of said material and below 500 pounds per square inch.

4,223,067

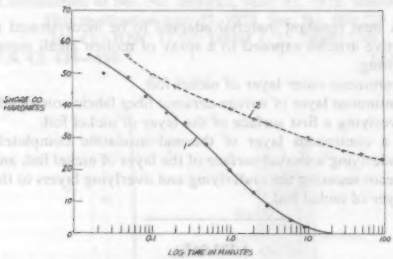
FOAM-LIKE PRESSURE-SENSITIVE ADHESIVE TAPE

Dennis L. Levens, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 797,409, May 16, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 889,541

Int. Cl.[2] **B32B** *3/26, 17/00*

U.S. Cl. 428—308 **12 Claims**



1. Pressure-sensitive adhesive tape comprising a pressure-sensitive adhesive layer having a thickness exceeding 0.2 mm and consisting essentially of a polymeric pressure-sensitive adhesive matrix and glass microbubbles of specific gravity not exceeding 1.0 dispersed throughout the matrix, the microbubbles having an average diameter of 10 to 200 micrometers and comprising 20 to 65 volume percent of the pressure-sensitive adhesive layer, the thickness of which exceeds three times the average diameter of the microbubbles and twice the diameter of substantially every microbubble, said matrix being substantially free from voids except for the hollow spaces of the individual microbubbles.

4,223,068

RIGID POLYURETHANE FOAM CONTAINING POLYESTER RESIDUE DIGESTION PRODUCT AND BUILDING PANEL MADE THEREFROM

William L. Carlstrom; Ronald W. Reineck, both of West Bend, and Glenn R. Svoboda, Grafton, all of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Sep. 27, 1978, Ser. No. 946,323

Int. Cl.[2] **C08G** *18/14, 18/42;* **B32B** *5/20*

U.S. Cl. 428—310 **4 Claims**

1. A method for making rigid polyurethane foam which comprises combining

(a) an organic polyisocyanate;

(b) an organic polyol;

(c) a halogenated alkane blowing agent;

(d) a surfactant;

(e) a catalyst for the reaction of —OH and —NCO radicals;

wherein from 5 to 30 percent of the weight of the said organic polyol is a digestion product obtained by

digesting polyalkylene terephthalate having a molecular weight greater than 15,000 in a reactive solvent selected from the class consisting of organic diols and triols having a molecular weight from 62 to 500 until the digestion product is soluble in acetone at room temperature;

and recovering a resulting rigid polyurethane foam which has a lower overall density than a corresponding polyurethane foam made from the same ingredients except for the said digestion product and which foam exhibits equivalent or superior shear strength and compressive strength when compared to the corresponding rigid polyurethane foam of the same overall density made from the same ingredients except for the said digestion product.

4,223,069

SUBSTRATE WITH MULTI-LAYER NONSTICK COATING

Jacques M. L. Berghmans, Lint, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 874,492, Feb. 2, 1978, abandoned. This application Dec. 29, 1978, Ser. No. 382

Int. Cl.[2] **B32B** *5/30, 15/08;* **A47J** *37/01*

U.S. Cl. 428—324 **6 Claims**

1. An article suitable for use as bakeware comprising a heat-resistant substrate coated with a multi-layered coating comprising:

a primer coat comprising an epoxide-formaldehyde-nitrogen resin and optionally aluminum flake,

an intermediate coat comprising a polymethylphenylsiloxane resin derived from a cross-linkable precondensate having a silicon-bonded hydroxyl content of at least about 3%, based on the weight of the precondensate, an epoxy resin, talc, and aluminum flake, and

a topcoat consisting essentially of a polymethylphenylsiloxane resin derived from a cross-linkable precondensate having a silicon-bonded hydroxyl content of about 2 to 4%, based on the weight of the precondensate, and aluminum flake.

4,223,070

IMPREGNATED POROUS GRANULES WITH SLOW RELEASE PORE MEMBRANES AND PROCESS THEREFOR

Alice U. Hahn, Orinda; Richard H. Rider, El Cerrito; Herbert B. Scher, Moraga, and Garrard L. Hargrove, Vacaville, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 4, 1978, Ser. No. 902,572

Int. Cl.[2] **B32B** *19/00;* **C08J** *5/24, 9/40;* **C08K** *7/24*

U.S. Cl. 428—407 **28 Claims**

15. An article of manufacture which comprises a porous

granule impregnated with a material which is at least partially immiscible with water, the pores of which are sealed with a porous polyurea membrane formed by

(a) applying to said granule an organic solution comprising said material and an organic polyisocyanate, and

(b) applying to said granule an aqueous solution comprising water and a catalytic amount of a catalyst selected from the group consisting of a basic organic tertiary amine and an alkyl tin carboxylate.

4,223,071

HIGH VOLTAGE INSULATING COMPOSITIONS CONTAINING PHOSPHORUS COMPOUNDS

Nicodemus E. Boyer, Redwood City, Calif.; Travers K. Cammack, II, Bartlesville, Okla., and David D. Nyberg, Sunnyvale, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

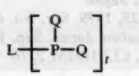
Filed Jan. 13, 1978, Ser. No. 869,268
Int. Cl.² H01B 3/00
U.S. Cl. 428—411 **17 Claims**

1. A high voltage insulating composition comprising

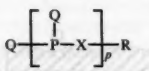
(1) a polymer;

(2) an anti-tracking additive effective in reducing tracking; and

(3) a phosphorus-containing compound effective in improving the resistance of the composition to erosion by high voltage stress, said compound being selected from (a) complexes of a metal salt wherein the metal is a transition metal other than copper, and a compound having a formula selected from



(I)



(II)

wherein

t is 1;

p is integer greater than 1;

X is independently selected from oxygen and sulphur;

L is an —R group;

one of the Q groups is an —R group and the other Q group is an R group or an —XR group; and

R is independently selected from hydrogen atoms and organic groups; and

(b) reaction products derived from the reaction of at least one said complex in the presence of the polymer to form higher molecular weight products.

4,223,072

FLEXIBLE COATING RESINS FROM SILOXANE RESINS HAVING A VERY LOW DEGREE OF ORGANIC SUBSTITUTION

Ronald H. Baney, Midland, and Len A. Harris, Rhodes, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 863,970, Dec. 23, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 970,023
Int. Cl.² B32B 27/36
U.S. Cl. 428—412 **13 Claims**

1. An article comprising a solid substrate coated with a pigment-free aqueous coating composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution, or in an ether ester of ethylene or propylene glycol-water solution, of the partial condensate of a mixture of silanols of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms and phenyl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, at least 1 weight percent of the silanol being of the formula $phenylSi(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 2.8 to 6.0.

4,223,073

HIGH-TEMPERATURE DAMPING COMPOSITE

Donald B. Caldwell, Lake Elmo, and Thomas F. Gardeski, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 887,077, Mar. 15, 1978, abandoned. This application Oct. 30, 1978, Ser. No. 955,789
Int. Cl.² B32B 15/06, 15/08; F16F 15/04, 15/12
U.S. Cl. 428—422 **12 Claims**

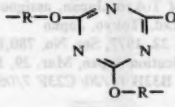
1. A composite at least ¼ meter in both width and length of a structural metal sheet and a viscoelastic layer, which composite can be formed to provide components of or facings for machines in order to provide effective damping of vibrations in such machines during prolonged high-temperature operation,

said metal sheet having an average plastic strain ratio r of at least 1.3, a strain-hardening exponent n of at least 0.11 in the equation

$$\sigma = K\epsilon^n$$

where σ is the true stress, K is a constant and ϵ is the true strain, and a thickness of at least 0.2 mm, and

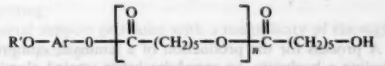
said viscoelastic layer having a thickness of at least 20 micrometers and being a cured polycyanurate polymer comprising the repeating unit



wherein each R is the residue after removal of the hydroxyl radicals from one of

(a) HO—Ar—OH

(b)



(c) $HOCH_2—(CH_2CH_2)_j(CF_2CFX)_k]_m\ CH_2OH$

(d) $HO—CH_2CF_2(CF_2)_kCF_2CH_2OH$

wherein

h is 0 or an integer of 1 to 6,

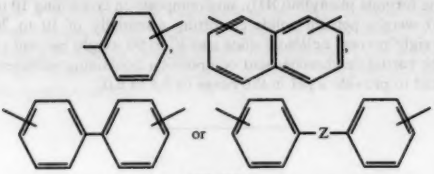
j and k are integers whose ratio j/k is 1/1 to 10/1,

m is an integer of 1 to 100,

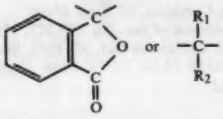
n is an integer of 1 to 20,

X is fluorine or perfluoroalkyl,

—Ar—represents

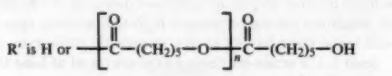


wherein Z represents —S—, —SO_2—, —O—,



wherein R_1 and R_2 represent hydrogen, lower alkyl or

wherein ω is an integer from 2 to 6,



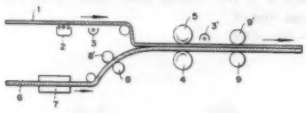
and the polycyanurate polymer has sufficient crosslinks such that its cyanurate nitrogen comprises 0.5 to 2% of its total weight when the polymer comprises 60% fluorine and 1.0 to 3.5% of its total weight when it is free from fluorine.

4,223,074

PROCESS FOR PRODUCING METAL-BOEHEMITE LAMINATES

Risaburo Yoshida; Hidetoshi Nagata; Michihisa Naito, and Keisuke Kaiho, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,147
Claims priority, application Japan, Mar. 29, 1976, 51-33491
Int. Cl.[2] B32B *15/20;* C23F *7/06*
U.S. Cl. 428—469 **20 Claims**



1. A process for the production of a laminate, comprising laminating a boehmite- or pseudoboehmite-treated aluminum foil with an oxidation-treated polyolefin film with the treated surface of the foil facing to the treated surface of the film, under heat and pressure to produce the laminate without the use of binders for lamination.

11. A heat sealable laminate for packaging foodstuffs, comprising (1) an oxidation-treated polyolefin film selected from the group consisting of oxidation-treated high-density polyethylene films and unstretched polypropylene films and (2) an aluminum foil having at least one side beohmite-treated, the film (1) and the foil (2) being laminated with each other with the boehmite-treated surface of the foil (2) facing to the oxidation-treated surface of the film (1) under heat and pressure.

4,223,075

GRAPHITE FIBER, METAL MATRIX COMPOSITE

William C. Harrigan, Jr., Seal Beach; Robert H. Flowers, Torrance, and Silas P. Hudson, Simi Valley, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Jan. 21, 1977, Ser. No. 761,188
Int. Cl.[3] B32B *5/14, 7/00*
U.S. Cl. 428—610 **4 Claims**

1. A graphite filament reinforced metal matrix composite comprising:

(a) at least one multi-strand graphite filament having an initial coating of titanium-boron on the surfaces thereof; and,

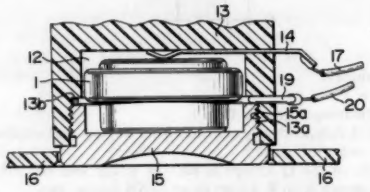
(b) a solid metal matrix having the graphite filament embedded therein and adhered thereto, the metal of said matrix being selected from the group consisting of aluminum, copper, tin lead, silver, zinc, magnesium, and alloys thereof, said metal containing alloying elements of titanium and boron in amounts effective to minimize the net absorption of the initial titanium-boron coating by the metal matrix when said matrix is heated to a temperature approaching the liquidus, or higher.

4,223,076

BATTERY CASING

Katumi Terada, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,338
Claims priority, application Japan, Sep. 12, 1978, 53/125943
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—96 **8 Claims**



1. A battery casing comprising a non-conductive frame which defines a battery receiving chamber said chamber having an inner sidewall, a terminal member disposed on the bottom of the battery receiving chamber for contact with one electrode of a battery contained therein, another terminal member formed of a resilient material and mounted on the inner sidewall of the battery receiving chamber in surrounding relationship with the periphery of the battery contained therein and electrically connected with the other electrode of the battery, and a lid which is detachably mounted on the frame.

4,223,077

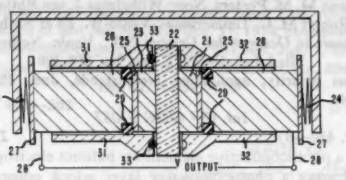
NA^+-CONDUCTING GLASS, GLASS-CERAMIC AND CRYSTALLINE CUBIC COMPOSITION

Barry E. Taylor, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 2, 1979, Ser. No. 54,224
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—191 **56 Claims**

1. Na^{30}-conducting glass of the composition comprising aNa_2O, $bSiO_2$, cM_2O_3, $dM'O_2$ and $eM''O$ wherein, based on the combined molar amounts totaling 100%, a is 32–41 mole %, b is 50–58 mole %, the ratio a/b is 0.575/1 to 0.760/1, c is

0–8 mole %, d is 0–7 mole %, e is 0–17 mole %, 2c+d+e is at least 8.7 mole %, M is one or more elements selected from the



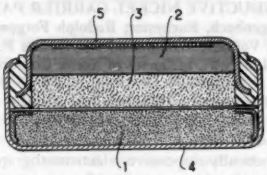
group consisting of the rare earth elements, yttrium and iron, M′ is Zr or Hf and M″ is Mg, Ca, Sr or Ba.

4,223,078

LITHIUM ELECTRIC CELL

Michel Armand, Grenoble; Raymond Brec, Nantes, and Alain Le Mehaute, Gif-sur-Yvette, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 26, 1979, Ser. No. 24,142
Claims priority, application France, Mar. 24, 1978, 78 08662
Int. Cl.[2] H01M 6/16
U.S. Cl. 429—194 **17 Claims**



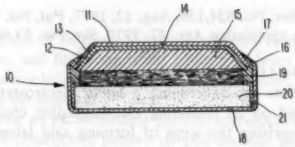
1. A electric cell which includes a positive electrode and a negative electrode in contact with a liquid electrolyte, said positive electrode including an active ternary compound of lithium, iron and sulfur whose general formula is $Li_x Fe_2S_z$ with x being not more than 2, and z being not less than 3.

4,223,079

NON-AQUEOUS PRIMARY BATTERY HAVING A STANNOUS SULFIDE CATHODE

Nehemiah Margalit, Levittown, and Robert A. Maroney, Yardley, both of Pa., assignors to ESB Technology Company, Yardley, Pa.

Filed Apr. 9, 1979, Ser. No. 28,285
Int. Cl.[2] H01M 6/16
U.S. Cl. 429—194 **6 Claims**



1. A non-aqueous primary battery having
(a) a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium;
(b) an electrolytic solution comprised of an organic solvent and a light inorganic salt dissolved therein;
(c) a separator; and
(d) a cathode consisting of stannous sulfide without binder or conductor added.

4,223,080

CELL AND FUEL CELL ELECTRODES HAVING POLY(PHOSPHAZENE) BINDER

James J. Auborn, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1979, Ser. No. 38,347
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—194 **12 Claims**

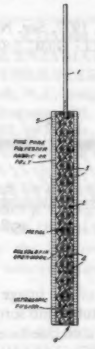
1. A cell comprising a first electrode, a second electrode, and an electrolyte, at least one of said electrodes comprising active electrode material and a binder; CHARACTERIZED IN THAT said binder comprises a polymer having the atom formula $(R_2P{=}N)_n$, n greater than or equal to 3, R selected from the group consisting of alkoxy, alkyl, amino, aryl, aryloxy, halogen and phenoxy.

4,223,081

COMPOSITE ELECTRODE FOR STORAGE BATTERIES AND THE LIKE

Peter Faber, Karlstein am Main, Fed. Rep. of Germany, assignor to Rheinisch-Westfälisches Elektrizitäts Werk AG, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 885,184, Mar. 10, 1978, Pat. No. 4,161,569, which is a continuation-in-part of Ser. No. 885,180, Mar. 10, 1978. This application May 17, 1979, Ser. No. 39,766
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823725
The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.
Int. Cl.[3] H01M 4/72
U.S. Cl. 429—234 **15 Claims**



1. A composite electrode for storage batteries and the like, comprising:
a metal support provided with a multiplicity of throughgoing openings;
respective polyolefin synthetic-resin layers constituted as openwork sheets of screened fabric, net or grid structure flanking said support on opposite sides thereof, said layers being directly fused together through the openings in said support and at points within said openings;
an electromechanically active mass received in the openworks of said layers; and
respective fine-porous cover layers in the form of polyester fabric or felt overlying and bonded to the respective polyolefin layers.

4,223,082

ULTRASONOGRAPHY

Robert B. Rosenfeld, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 770,323, Feb. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 854,556, Nov. 25, 1977, abandoned. This application Apr. 18, 1979, Ser. No. 31,083

Int. Cl.[2] G03C *5/04, 5/24, 5/26*

U.S. Cl. 430—3 63 Claims

1. A process of forming an ultrasonographic image employing a silver halide emulsion layer containing photographic element comprising

imagewise exposing the photographic element to ultrasonic radiation at an intensity and for a duration sufficient to alter the exposure response of the element to electromagnetic radiation, but below that which will produce a latent image in the absence of externally applied electromagnetic radiation, the ultrasonic energy applied to the photographic element being less than 100 watt-sec/cm^2;

exposing the element to electromagnetic radiation, thereby producing a latent image therein defined by the ultrasonic radiation exposure; and

photographically processing the element to produce a visible image corresponding to the latent image.

4,223,083

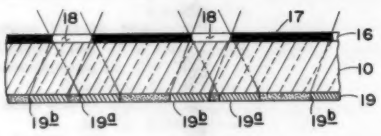
VIRTUAL MASK EXPOSURE SYSTEM FOR CRT SCREEN MANUFACTURE

Frederic R. Engstrom, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 27, 1977, Ser. No. 864,949

Int. Cl.[2] G03C *5/00*

U.S. Cl. 430—24 7 Claims



1. In the manufacture of an image display screen for a shadow mask cathode ray tube, said screen including a pattern of photodeposited elements on one face of a transparent support, the method of depositing said elements that includes the steps of:

(1) forming a replica of a cathode ray tube shadow mask on the opposite face of the support, wherein said replica is formed by steps including: (a) applying a layer of a photosensitive material to said opposite face, (b) mounting said shadow mask adjacent said one face, (c) exposing said photosensitive layer to actinic radiation transmitted through the apertures of said mask to form in said layer a developable latent image of said mask, and (d) treating the exposed photosensitive layer to develop said image,

(2) applying a layer of photosensitive material to said one face, and

(3) exposing said layer to a pattern of actinic radiation transmitted through said mask replica and support.

4,223,084

PHOTOCONDUCTIVE ELEMENT BASED ON MIXED ZINC OXIDES

Wilhelmus M. M. Peeters, Neer; Wilhelmus J. van Rhijn, Venlo, and Robert M. G. Timmermans, Venlo-W., all of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Jun. 10, 1977, Ser. No. 805,308

Claims priority, application Netherlands, Jun. 28, 1976, 7607044

Int. Cl.[2] G03G *5/087*

U.S. Cl. 430—87 2 Claims

1. In a photoconductive element for indirect electrophotography having a photoconductive layer which comprises at least two photoconductive zinc oxides dispersed in a binder, the improvement whereby the photoconductive element is enhanced in constancy of behavior and service life for repeated use in indirect electrophotography, comprising that said zinc oxides consist essentially of between 6 and 30% by weight of continuous tone zinc oxide and between 70 and 96% by weight of photoconductive zinc oxide that is not continuous tone zinc oxide and said binder consists predominantly of an acrylic resin having an acid number between 10 and 30 and also comprises 1 and 15% by weight of styrene-modified alkyd resin, and the weight ratio of zinc oxide to binder lies between 5:1 and 3:1.

4,223,085

SEMI-CONDUCTIVE NICKEL CARRIER PARTICLES

Robert J. Hagenbach, Rochester; Rudolph Forgensi, Webster; Stewart W. Volkers, Williamson, and Dennis F. Di Orazio, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1976, Ser. No. 673,320

Int. Cl.[2] G03G *9/14, 9/10*

U.S. Cl. 430—108 12 Claims

1. A magnetically-responsive electrostatographic carrier particle having an oxide coating, said carrier particle having been prepared by heat treating nickel particles in an ambient atmosphere at a temperature of between about 600° C. and about 1000° C. for between about 5 and about 10 minutes, said carrier particle having an average particle diameter of from between about 30 microns and about 1,000 microns, and wherein said carrier particle is further characterized as having semiconductive properties wherein the surface of said carrier particle has a volume resistivity of between about 10^6 ohm-cm at about 300 volts and up to about 10^8 ohm-cm at about 1,000 volts.

4,223,086

ELECTROSTATIC PROCESS USING LIQUID DEVELOPER COMPRISING POLYMERIC PHOSPHONATE DISPERSANT

Stewart H. Merrill, Rochester, and Domenic Santilli, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 824,135, Aug. 12, 1977, Pat. No. 4,170,563. This application Apr. 27, 1979, Ser. No. 33,600

Int. Cl.[2] G03G *13/10*

U.S. Cl. 430—119 12 Claims

1. A process for developing a latent electrostatic charge image carried on an insulating electrographic element, said process comprising the steps of forming said latent electrostatic charge image on said electrographic element and developing said charge image by contacting it with a liquid developer comprising marking particles dispersed in an electrically insulating carrier liquid and a soluble vinyl polymeric dispersing agent containing a phosphonate moiety wherein said moiety is a phosphonic acid group, a phosphonic salt group, a half-ester of a phosphonic acid group, or a salt of a half-ester of a phosphonic acid group, the solubility ratio of said polymeric dispersing agent in the carrier liquid being at least about 0.825.

4,223,087

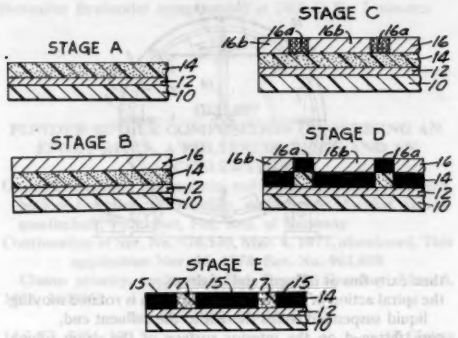
METHOD OF MAKING PLATE OLEOPHILIC

David R. Boston, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 531,712, Dec. 11, 1974, abandoned, and a continuation-in-part of Ser. No. 431,364, Jan. 7, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,480

Int. Cl.[2] G03F 7/02

U.S. Cl. 430—302 5 Claims



1. A method for rendering oleophilic a surface having metallic silver in an imagewise pattern thereon comprising contacting said metallic silver with a homogeneously stable acidic aqueous salt solution comprising a ferricyanide anion and an organic cation complexing agent capable of forming a water-insoluble, oleophilic complex with oxidized silver, said cation comprising a protonated nitrogen-substituted hydrocarbon compound containing a formal imine group therein, said imine group being in resonant association with adjacent groups within said hydrocarbon compound.

4,223,088

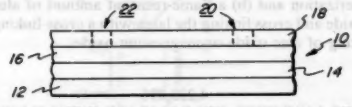
METHOD OF FORMING DEFINED CONDUCTIVE PATTERNS IN A THIN GOLD FILM

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 814,356, Jul. 11, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,628

Int. Cl.[2] G03C 5/00

U.S. Cl. 430—323 8 Claims



1. A method of forming a defined conductive pattern in a laminar film, said film comprising a thin gold layer interposed between an insulating substrate and a thin ceramic overlayer, comprising the steps of:

(a) forming an etch resistant pattern corresponding to said defined conductive pattern on said ceramic layer,

(b) immersing the film in a base etchant both comprising potassium hydroxide for removing said ceramic layer in nonpattern areas while exposing said gold layer, the exposure of the gold layer permitting removal thereof chemically unassisted by said etchant, and

(c) forceably applying a medium to said exposed gold layer causing the mechanical removal thereof in said nonpattern areas, wherein the step of applying a medium comprises either (A) agitating the film while immersed in the base etchant bath, (B) directing a fluid stream of a non-etchant for gold against the surface of the film, (C) swabbing the surface of the film with a non-etchant for gold, or, (D) a combination of such medium applications.

4,223,089

PROCESS AND DIAGNOSTIC DEVICE FOR THE DETERMINATION OF AMMONIA AND OF SUBSTRATES WHICH REACT WITH THE FORMATION OF AMMONIA

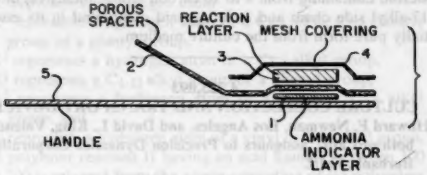
Anselm Rothe; Adolf K. Selle, both of Birkenau; Hans-Rudolf Lange, Lampertheim; Walter Rittersdorf, and Wolfgang Werner, both of Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,719

Claims priority, application Fed. Rep. of Germany, May 17, 1978, 2821469

Int. Cl.[2] G01N 31/14, 33/16, 21/06, 31/22

U.S. Cl. 435—12 13 Claims



1. Diagnostic device for the determination of ammonia and of substrates reacting with the formation of ammonia, comprising handle means, and indicator layer for gaseous ammonia on said handle means, an alkaline buffercontainer reaction layer, said reaction layer being positioned a distance of 10 to 200μ above the indicator layer by spacer means, said spacer means and the reaction layer being readily separable from the indicator layer.

4,223,090

REAGENTS FOR THE ENZYMATIC DETERMINATION OF TRIGLYCERIDES

John C. Mazza, Wenonah, N.J., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 13, 1978, Ser. No. 924,528

Int. Cl.[2] C12Q 1/44

U.S. Cl. 435—19 12 Claims

1. In an enzyme reagent for detecting triglycerides in biological fluids which includes a lipase, glycerol dehydrogenase (GDH), pyridine nucleotide (PN), a buffer, a tetrazolium compound and diaphorase, the improvement which comprises manganese present at a concentration of from about 0.05 mM to about 0.15 mM.

4,223,091

PROCESS FOR PRODUCING STEROIDAL ALCOHOLS

Yukio Imada, Yokohama, and Katsuhiko Takahashi, Kawasaki, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,349

Claims priority, application Japan, Oct. 14, 1977, 52-123184; Oct. 14, 1977, 52-123185

Int. Cl.[2] C12P 33/16

U.S. Cl. 435—55 9 Claims

1. A process for producing 20 α-hydroxymethyl-pregna-1,4-diene-3 one, 20 α-hydroxymethyl-pregna-4-en-3-one, or mixtures thereof, which comprises cultivating a microorganism which is a mutant belonging to the *Mycobacterium paraforturtuum* complex and being capable of producing 20α-hydroxymethyl-pregna-1,4-diene-3-one or 20α-hydroxymethylpregna-4-en-3-one from a sterol in the presence of a sterol substrate.

4,223,092

PROCESS FOR PREPARING 9α-OH BN ACID METHYL ESTER

Merle G. Wovcha; Frederick J. Antosz, both of Kalamazoo; John M. Beaton, Portage; Alfred B. Garcia, Kalamazoo, and Leo A. Kominek, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 844,366, Oct. 21, 1977. This application Apr. 23, 1979, Ser. No. 32,188

Int. Cl.[3] C12P *33/16*

U.S. Cl. 435—55 4 Claims

1. A process for preparing 9α-OH BN acid methyl ester in its essentially pure form which comprises cultivating a mutant microorganism selected from the group consisting of Arthrobacter, Bacillus, Brevibacterium, Corynebacterium, Microbacterium, Nocardia, Protaminobacter, Serratia, and Streptomyces, said mutant being characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 8 to 10 carbon atoms, inclusive, and accumulate 9α-OH BN acid methyl ester in the fermentation beer, in an aqueous nutrient culture medium under aerobic conditions in the presence of a steroid containing from 8 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and isolating said compound in its essentially pure form from the culture medium.

4,223,093

CULTURE COLLECTION AND TRANSPORT DEVICE

Howard F. Newman, Los Angeles, and David L. King, Valencia, both of Calif., assignors to Precision Dynamics Corporation, Burbank, Calif.

Filed Aug. 25, 1978, Ser. No. 935,841

Int. Cl.[2] C12M *1/30*

U.S. Cl. 435—295 16 Claims

1. A culture collection and transportational device comprising the combination of: an open-ended, tubular-like body member having a closed end adapted to carry a fluid thereat; a conformable piston-like member slideably positionable adjacent said closed end to form a normally fluid-tight chamber therebetween in which said fluid medium is carried, said piston-like member having at least one perimetric continuous sealing lip thereabout in abutting relationship to the interior surface of said tubular-like body member, said piston-like member being partially collapsible when subjected to selected applied pressure to open a fluid passageway about the outer periphery of said piston-like member.

4,223,094

HORIZONTAL ROTATING DRUM FERMENTOR

V. A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed Aug. 29, 1977, Ser. No. 828,956

Int. Cl.[2] C12M *1/10, 1/04, 1/06, 1/02*

U.S. Cl. 435—312 1 Claim

1. A fermentation apparatus comprising;

an aseptically sealed, horizontally rotated, cylindrically shaped drum,

supported by stiffening rings around the external circumference

which bear on external drive wheels or gears,

which cause the cylindrical drum to rotate around a horizontal axis,

ascepticity of the drum contents assured by a three fluid influent and three fluid effluent connection,

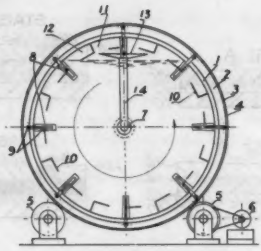
said influent connection providing fluid which is to be fermented, removing spent solid materials generated during the fermentation, and providing a heat exchanger fluid,

said effluent connection discharging fermented fluid, gases collected above the drum liquid level, and spent heat exchanging fluid,

the interior of the drum is provided with two or more parallel mounted fins in a partial spiral configuration to centerline,

mounted on interior drum walls in a manner as to connect with the heat exchanging fluid,

which enters fins at influent end of drum, and following circulation therein,



then exits fins at effluent end of drum,

the spiral action of the fins when the drum is rotated moving liquid suspended solids therein to the influent end,

cups fastened on the interior surface of the drum which during rotation lift the solids to top of drum,

said cups spill the solids to an effluent funnel and discharge pipe,

for disposal through influent rotary facility, and or a light source attached to the interior wall of the drum.

4,223,095

FLAME-RESISTANT POLYURETHANE FOAM AND A PROCESS FOR ITS PRODUCTION

Heinz Esser, Burscheid; Hans W. Illger, Roesrath; Heinz Müller, Leverkusen; Willi Kost, Cologne, and Alberto C. Gonzalez-Dörner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,669

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754313

Int. Cl.[2] C08G *18/14, 18/83;* B32B *3/26, 5/18*

U.S. Cl. 521—55 7 Claims

1. A flame-resistant polyurethane foam prepared by a process which comprises treating a polyurethane foam with a mixture of (a) a polychloroprene latex containing from 1 to 7% by weight of carboxylic acid units chemically incorporated by polymerization and (b) a flame-resistant amount of aluminum hydroxide and cross linking the latex with a cross-linking agent consisting of zinc oxide or magnesium oxide.

4,223,096

RUBBER-MODIFIED TERPOLYMER WITH IMPROVED MOLDING CHARACTERISTICS

Yoon C. Lee, and Quirino A. Trementozzi, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 865,049, Dec. 27, 1977. This application Oct. 2, 1978, Ser. No. 948,122

Int. Cl.[2] C08L *51/04, 53/02*

U.S. Cl. 525—74 5 Claims

1. A process for the production of a polymeric molding composition which comprises polymerizing a monomer mixture comprising from 50 to 83% by weight of a vinylaromatic monomer, from 15 to 30% by weight of an unsaturated dicarboxylic acid anhydride and from 2 to 20% by weight of an unsaturated nitrile in the presence of from 2 to 30% by weight based on the composition weight of a rubber having a glass transition temperature below 0° C. to form a rubber substrate grafted with a superstrate terpolymer and dispersed in a matrix

terpolymer; said process comprising forming a solution comprising the vinylaromatic monomer, the unsaturated nitrile monomer, a minor amount of the anhydride monomer and the rubber; catalytically initiating polymerization of the mixture at a temperature below 120° C., and maintaining a low anhydride monomer concentration by gradual continuous addition of the balance of the anhydride monomer during the polymerization reaction so as to produce a rubber-modified terpolymer of uniform composition that remains thermoformable after having been exposed to temperatures of 190° C. for 30 minutes and thereafter Brabender compounded at 240° C. for 2 minutes.

4,223,097

POWDER BINDER COMPOSITION COMPRISING AN EPOXY RESIN, A POLYESTER RESIN AND AN ACCELERATOR

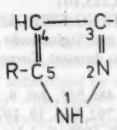
Gerhard Johannes, Taunusstein, and Hermann Hotze, Auringen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 774,530, Mar. 4, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,409

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609361

Int. Cl.[2] C08L *63/02, 67/02*

U.S. Cl. 525—107 **11 Claims**



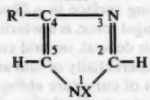
1. A powder binder composition comprising a mixture of

(I) an epoxy resin based on polyhydric phenols and epihalohydrins,

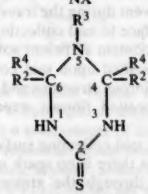
(II) a hardener comprising a polyester having free carboxylic groups, and which constituents of said polyester have been reacted during the polycondensation or polymerization with from 0.05 to 5% by weight based on the weight of constituents of component II of an accelerator comprising at least one compound of the formulae

(I)

(II)



(III)



(IV)

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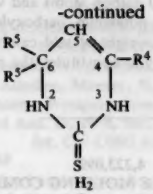
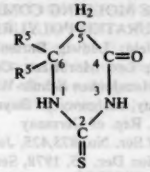


(V)



(VI)

wherein

R represents a hydrogen atom or a C_{1-4} alkyl group,

R^1 represents a hydrogen atom

R^2 represents a hydrogen atom or a C_{1-4} alkyl, C_{2-4} alkenyl group or a phenyl group,

R^3 represents a hydrogen atom or a C_{1-7} alkyl group,

R^4 represents a C_{1-12} alkyl group or a phenyl group,

R^5 represents a hydrogen atom or an aryl or C_{1-6} alkyl group, and

X represents a hydrogen atom or a vinyl or C_{1-4} alkyl group, said polyester reactant II having an acid number between 100 and 200 is selected from the group consisting of (a) polyesters derived from polyols and an aromatic acid, or an aromatic acid containing at most 42.5% as much by weight of an aliphatic or cycloaliphatic acid and (b) a copolymer containing ester groups and carboxyl groups.

4,223,098

BLOWING CATALYST COMPOSITION FOR LOW DENSITY FLEXIBLE POLYURETHANE FOAMS

Kenneth Treadwell, Rahway, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 879,633, Feb. 21, 1978, Pat. No. 4,173,691. This application Oct. 30, 1978, Ser. No. 955,906

Int. Cl.[3] C08G *18/24*

U.S. Cl. 521—116 **6 Claims**

1. A method for preparing low density cellular polyurethanes, said method comprising reacting a polyol having at least two reactive hydrogen atoms, as determined by the Zerewitinoff method, with an organic polyfunctional isocyanate in the presence of

(a) from 0.5 to 40%, based on the weight of said polyol, of a blowing agent consisting essentially of water and from 10 to 90%, based on the total weight of said blowing agent, of methylene chloride,

(b) a catalytically effective amount of a gel catalyst selected from the group consisting of stannous salts of monocarboxylic acids, wherein the acids contain from 1 to 20 carbon atoms, and organotin compounds of the general formula R_aSnX_{4-a}, wherein R is selected from alkyl and alkenyl radicals, each of which contain from 1 to 18 carbon atoms, cycloalkyl, aryl, alkaryl and aralkyl hydrocarbon radicals, and the foregoing radicals when inertly substituted, and X represents a monovalent radical selected from the group consisting of halogen atoms and radicals of the general formula R'COO—, R'S—, R'O— and —SR"COOR' wherein R' is in turn selected from the same group as R and R" is an alkylene radical containing from 1 to 8 carbon atoms, and

(c) a catalytically effective amount of a blowing catalyst composition consisting essentially of an antimony carboxylate, a potassium carboxylate and a zinc carboxylate, wherein the hydrocarbyl portions of said carboxylates

contain from 1 to 20 carbon atoms and wherein each of said antimony and potassium carboxylates constitutes from 10 to 40% by weight of said catalyst composition and the zinc carboxylic constitutes the remaining 20 to 80% by weight.

4,223,099

COPOLYMERIZABLE MOLDING COMPOSITIONS BASED ON UNSATURATED POLYURETHANES

Hannes von Harpe, Krefeld; Ludwig Bottenbruch, Krefeld; Bernd Peltzer, Krefeld; Leo Morbitzer, Cologne; Helmut Korber, Odenthal, and Hansjochen Schulz-Walz, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 873,425, Jan. 30, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 970,225

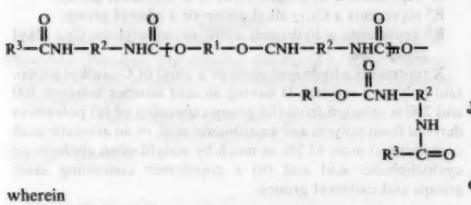
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704424; Feb. 19, 1977, 2707230

Int. Cl.[2] C08L *75/00*

U.S. Cl. 525—126 **5 Claims**

1. A molding composition comprising:

(a) 5 to 77% by weight of a polyurethane of the formula

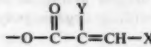


wherein

R^1 is alkylene with 2 to 8 carbon atoms, cycloalkylene or arylene with 5 to 12 carbon atoms, a mixed aliphatic/cycloaliphatic or a mixed aliphatic/aromatic divalent group with 7 to 24 carbon atoms, each of these groups may also contain 1 to 3 oxygen atoms, or a divalent radical of a polyester which contains no α,β-ethylenic unsaturations,

R^2 is alkylene with 2 to 8 carbon atoms, cycloalkylene or arylene with 6 to 12 carbon atoms or a mixed aliphatic/cycloaliphatic or a mixed aliphatic/aromatic divalent group with 7 to 24 carbon atoms,

R^3 is



X is H, CH_3, COOH or COO—"alkylene"—OH,

Y is hydrogen or methyl,

"alkylene" is alkylene with 2 to 6 carbon atoms, and

n is zero or a number from 1 to 15;

(b) 20 to 80% by weight of a vinyl or vinylidene compound copolymerizable with (a); and

(c) 3 to 25% by weight of a rubbery-elastic polymer;

wherein the composition percentages are based on the sum of the weights of components (a), (b) and (c); and wherein said composition, upon curing, yields a two-phase system comprising a rubbery phase containing said rubbery-elastic polymer and having a glass transition temperature of between −90° and 10° C. and a resin phase having a glass transition temperature of between 50° and 250° C., the discontinuous phase having an average particle diameter of 0.1 to 100 μm; and

wherein the specific fracture surface energy of the resulting copolymer phase of (a) and (b), without (c), being formed during hardening will be greater than 0.6×10^5 ergs per square centimeter.

4,223,100

FLAME RETARDANT AROMATIC POLYCARBONATE WITH GOOD MECHANICAL PROPERTIES AND MELT STABILITY

Gerard E. Reinert, McMurray, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 53, Jan. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,787, Aug. 18, 1978, abandoned, which is a continuation of Ser. No. 759,606, Jan. 14, 1977, abandoned. This application Apr. 18, 1979, Ser. No. 31,089

Int. Cl.[2] C08L *69/00*

U.S. Cl. 525—146 **16 Claims**

1. A thermoplastic aromatic polycarbonate composition consisting essentially of:

(a) a thermoplastic aromatic polycarbonate having a melt flow of between 1 and 24 grams per ten minutes,

(b) between about 0.01 and 1 wt. %, based on the weight of the total composition, of an alkali metal salt of an inorganic acid,

(c) between about 0.01 and 1 wt. %, based on the weight of the total composition, of a fibril forming polytetrafluoroethylene, and

(d) between 0.05 and 1.0 wt. %, based on the weight of the total comparison, of aromatically bound chlorine or bromine contained in a compound other than an organic alkali metal or alkaline earth metal salt.

4,223,101

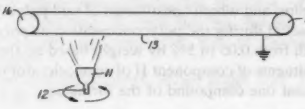
METHOD OF PRODUCING FIBROUS STRUCTURE

Jerome Fine, Passaic, N.J., and Sigismondo A. De Tora, Spring Valley, N.Y., assignors to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 486,567, Jul. 8, 1974, which is a continuation of Ser. No. 116,792, Feb. 19, 1971, abandoned. This application Jul. 17, 1978, Ser. No. 925,646

Int. Cl.[2] B22D *23/08*

U.S. Cl. 528—76 **20 Claims**



1. A process for producing fibrous structures comprising:

(a) supplying a liquid solution of a thermoplastic elastomeric polyurethane in a volatile solvent to a surface rotating about an axis to form thereon a film which is whirled from said surface by centrifugal force,

(b) maintaining an electrostatic potential between said film and a collecting surface transverse to said axis to form said solution into electrically charged fibers, to attract said fibers to said collecting surface in a fiber pattern which, owing to said centrifugal force, is a whirling pattern annular to said axis, and to deposit, on said collecting surface, fibers oriented circumferentially of said annular pattern in paths having a radius of curvature above 4 cm.

(c) evaporating said solvent during the travel of said solution from the rotating surface to said collecting surface so that the deposited fibers contain sufficient solvent to bond to fibers previously deposited upon said collecting surface, and thereby form a fibrous structure and

(d) removing said deposited fibrous structure from said collecting surface,

the distance between said collecting surface and said film being sufficient that there is no spark or visible corona discharge passing through the atmosphere from the

rotating surface carrying said film to said collecting surface,

said supplied solution of step (a) having a viscosity of above 500 centipoises and said polyurethane having an intrinsic viscosity of above 0.7.

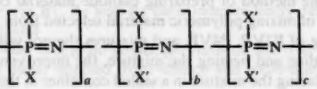
4,223,102

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUENTS DERIVED FROM ALKYL OR ARYL CARBAZATES

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1978, Ser. No. 953,719
Int. Cl.[2] C08G *79/02, 79/04*
U.S. Cl. 528—168 **11 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is —NHNHCOOR in which R is alkyl containing from 1 to 12 carbon atoms, cycloalkyl containing from 3 to 12 carbon atoms or aryl; wherein X′ is X or is selected from the group consisting of substituted or unsubstituted alkoxy, aryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

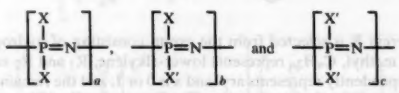
4,223,103

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUENTS DERIVED FROM THIENYL ALCOHOLS

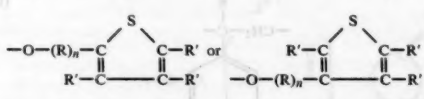
Donald N. Schulz, Hartville, and Jung W. Kang, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 26, 1979, Ser. No. 15,378
Int. Cl.[3] C08G *79/02, 73/00*
U.S. Cl. 528—168 **12 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is



in which R is an alkylene radical containing from 0 to 10 carbon atoms, R′ is hydrogen or alkyl containing from 1 to 10 carbon atoms and n is an integer of from 0 to 10; wherein X′ is X or is selected from the group consisting of substituted or unsubstituted alkoxy, aryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

4,223,104

COPOLY (CARBONATE/PHOSPHONATE) COMPOSITIONS

Ki-Soo Kim, Irvington, N.Y.; Arthur J. Yu, Stamford, Conn., and Siegfried Altscher, Monsey, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 11, 1978, Ser. No. 932,840
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—169 **12 Claims**

1. In a copoly(carbonate/phosphonate) composition formed by the reaction of: (1) at least one dihydric phenol; (2) at least one carbonate precursor; and (3) at least one organophosphorus dihalide, wherein the improvement consists essentially of the presence of an effective amount of a chain branching agent to increase the melting point and inherent viscosity of said composition.

4,223,105

METHOD FOR PREPARING HETEROCHAIN POLYMERS

Vadim B. Igonin, ulitsa Usti na Labe, 4, kv. 5; Vladimir Z. Nikonov, ulitsa Usti na Labe, 22, kv. 13; Lev B. Sokolov, ulitsa Truda, 18, kv. 35; Valentin M. Savinov, ulitsa Usti na Labe, 20, kv. 20; Vitaly A. Vasiliev, ulitsa Egorova, 5, kv. 61; Vladimir M. Ivanov, ulitsa Lunacharskogo, 12, kv. 5, all of Vladimir; Vladimir A. Nikiforov, ulitsa 1 Kirova, 7a, kv. 18, Kalinin; Savely A. Zhizhilev, Migalovo, 22, kv. 57, Kalinin; Tatyana I. Nikitina, prospekt Chaikovskogo, 31a, kv. 87, Kalinin; Lidia A. Klimenko, ulitsa Stroitelei, 10, kv. 29, Kalinin, and Olga I. Mischenko, Migalovskaya naberezhnaya, 10, kv. 19, Kalinin, all of U.S.S.R.

Filed Jul. 29, 1977, Ser. No. 820,217
Int. Cl.[2] C08G *63/16, 63/18, 63/22, 69/28*
U.S. Cl. 528—179 **13 Claims**

1. A method for preparing heterochain polymers selected from the group consisting of polyamides and polyarylates, comprising interphase polycondensation of dihaloanhydrides of dicarboxylic acids with aqueous solutions of bisfunctional compounds selected from the group consisting of diamines and bisphenols, in the presence of an acid acceptor, said interphase polycondensation being carried out at a temperature of 20°–115° C. and pressure of 0 to 0.8 atm. gauge by atomizing said dihaloanhydrides of dicarboxylic acids in the form of an aerosol by a compressed gas, into an aqueous solution of said bisfunctional compounds; the concentration of dihaloanhydrides of dicarboxylic acids in the aerosol being maintained within the range of 0.4×10^{-4} to 2×10^{-4} mol/liter of the gas; the dihaloanhydrides of dicarboxylic acids, which are solid under normal conditions, are liquefied prior to atomization by melting or by solution in a solvent inert, to the dihaloanhydrides at a concentration of from 5 to 20 moles of dihaloanhydride per liter of solvent; the dihaloanhydrides of dicarboxylic acids, which are liquid under normal conditions, are atomized directly and the product is recovered from the interphase polycondensation suspension.

4,223,106

BLOCK COPOLYESTERS WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolf Binsack, both of Krefeld, and Dieter Rempel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,208
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545720
Int. Cl.[2] C08F *8/00*
U.S. Cl. 525—173 **13 Claims**

1. Highly crystalline, thermoplastic block copolyesters which crystallise rapidly, have an intrinsic viscosity of at least 0.4 dl/g and consist of (A) 60–95% by weight, based on the sum of A and B, of copolyester segments based on terephthalic acid, ethylene glycol and codiol residues and (B) 40–5% by

weight, based on the sum of A and B, of block segments which are linked to A and have a glass transition temperature below 0° C. and an average molecular weight of 400 to 1,000,000, A and B being linked to one another via ester groups, characterised in that A comprises (a) at least 90 mol %, based on the acid component, of terephthalic acid residues, (b) 90–99.5 mol %, based on the sum of (b)+(c), of ethylene glycol residues and (c) 10–0.5 mol %, based on the sum of (b)+(c), of residues of codiols which have 4–10 C atoms and in which the OH groups are separated by aliphatic branched or unbranched alkylene groups with 3 or 4 C atoms and which either (1) carry at least one secondary or tertiary OH group or (2) carry two primary OH groups and are unsubstituted or monosubstituted or disubstituted by alkyl, the sum of the C atoms in the substituents, in the case of substitution, being at least 4.

4,223,107

BLENDS OF THERMOPLASTIC RESINS AND POLYINDENE OR COUMARONE-INDENE

George S. Li, Aurora, and Irving Rosen, Warrensville Heights, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 909,323, May 24, 1978, Pat. No. 4,162,277, which is a continuation of Ser. No. 816,245, Jul. 18, 1977, Pat. No. 4,117,040, which is a continuation of Ser. No. 644,122, Dec. 24, 1975, Pat. No. 4,066,717. This application Jan. 22, 1979, Ser. No. 5,548

Int. Cl.² C08L *45/02, 31/04*

U.S. Cl. 525—206 **1 Claim**

1. A composition having improved properties comprising a blend of (A) 100 parts by weight of polyvinyl acetate and (B) from 1 to 50 parts by weight of a member selected from the group consisting of polyindene an a coumarone-indene resin.

4,223,108

GLOSSY FIBRES OF THE MODACRYLIC TYPE HAVING REDUCED INFLAMMABILITY, AND COMPOSITIONS OF MATTER AND PROCESS FOR PRODUCING THE SAME

Giorgio Cazzaro, Saronno; Giancarlo Matera, Monza; Antonino Cavallaro, Cesano Maderno, and Marina Zani, Saronno, all of Italy, assignors to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

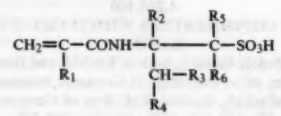
Filed Nov. 2, 1977, Ser. No. 847,746

Claims priority, application Italy, Nov. 3, 1976, 28980 A/76; Sep. 28, 1977, 27997 A/77

Int. Cl.² C08L *33/20, 41/00*

U.S. Cl. 525—212 **7 Claims**

1. Modacrylic fibers having a limiting oxygen Index of at least 26 and high glossiness comprising a mixture of a binary copolymer A containing from 88% to 98% of monomeric units derived from acrylonitrile and from 2 to 12% of monomeric units derived from a significantly homopolymerizable sulphonic acid monomer of the formula



and salts of said acid, wherein R_1 is hydrogen or a short chain alkyl radical and R_2, R_3, R_4, R_5 and R_6 are each hydrogen or an alkyl, cycloalkyl or aryl radical, and a binary copolymer B containing from 55% to 88% of monomeric units derived from acrylonitrile and from 12% to 45% of monomeric units derived from vinylidene chloride, the fibre containing from 12% to 40% by weight of copolymer A and from 88% to 60% by weight of copolymer B.

4,223,109

CALCIUM SALTS OF DIVINYL ETHER—MALEIC ANHYDRIDE COPOLYMER

Richard L. Wolgemuth, Plain City, Ohio, assignor to Adria Laboratories Inc., Columbus, Ohio

Filed Feb. 22, 1979, Ser. No. 13,936

Int. Cl.² C08F *222/06*

U.S. Cl. 525—327 **2 Claims**

1. The calcium salt of a solid, cyclic copolymer of divinyl ether and maleic anhydride, soluble in water and containing divinyl ether and meleic anhydride in a mole ratio of about 1:2.

4,223,110

CATHODE MATERIALS

Gary M. Phillips, West St. Paul, and Darrel F. Untereker, Cedar, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 16, 1978, Ser. No. 951,862

Int. Cl.² C08F *8/22*

U.S. Cl. 525—356 **21 Claims**

1. In the method of preparing cathode material comprising the steps of mixing polymeric material selected from the group consisting of P2VP, P4VP, and mixtures thereof with a quantity of iodine and heating the mixture, the improvement comprising placing the mixture in a sealed container in the presence of a protective atmosphere prior to heating and heating to a temperature of at least about 150° C.

4,223,111

PROCESS FOR PREPARING ARYLARSINE SUBSTITUTED POLYSTYRENE

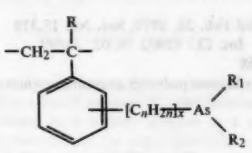
Curtis P. Smith, Cheshire, and George H. Temme, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 27, 1979, Ser. No. 69,763

Int. Cl.² C08F *8/22, 8/24, 8/42*

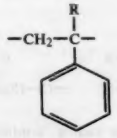
U.S. Cl. 525—356 **11 Claims**

1. A process for the preparation of a polymer having in its molecule at least one unit having the formula:



(I)

wherein R is selected from the group consisting of hydrogen and methyl, C_nH_{2n} represents lower-alkylene, R_1 and R_2 each independently represents aryl and x is 0 or 1, and the remainder of the recurring units in the polymer have the formula:

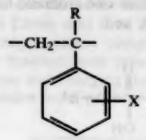


(II)

wherein R is as above defined;

which process comprises reacting a mixture of

(a) the corresponding polymer having in its molecule at least one unit represented by the formula:



(III)

wherein R has the meaning above defind and X is selected from the group consisting of chlorine, bromine, iodine, lower-chloroalkyl, lower-bromoalkyl and lower-iodoalkyl, the remainder of the recurring units in said polymer having the formula (II) above;

(b) at least 1 molar proportion, per unit of formula (III) in said starting polymer, of a triarylarsine of the formula:

wherein R_1, R_2 and R_3 each independently represents aryl; and

(c) at least two gram atoms, per mole of said triarylarsine, of a metal selected from lithium and sodium-potassium alloy.

4,223,112

LACTAM-POLYOL-POLYACYL LACTAM TERPOLYMERS

Ross M. Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

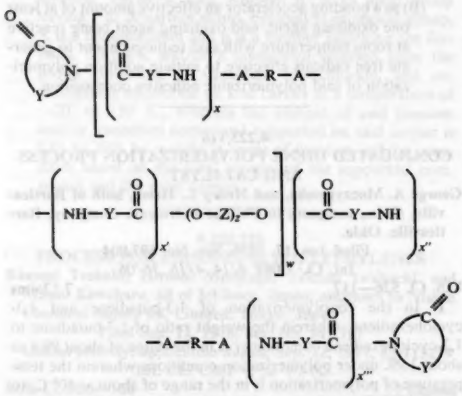
Continuation of Ser. No. 477,135, Jun. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 341,215, Mar. 14, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,797

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl. C08g *81/00*

U.S. Cl. 525—432 **6 Claims**

1. A lactam-polyol-polyacyl lactam block terpolymer having the general formula:



wherein $(O—Z)_z$ is a polymeric moiety and Z is a hydrocarbon or substituted hydrocarbon group said group being alkylene, arylene, alkylene carbonyl, arylene carbonyl, and mixtures thereof;

A is a carbonyl group;

R is a divalent or polyvalent hydrocarbon group comprised of from 1 to 4 carbon atoms;

Y is an alkylene or substituted alkylene having from about 3 to about 14 carbon atoms; x, x′, x″, and x‴ are integers with at least one x being an integer greater than one, and the total number of x's is equal to 2w +2; and z is an integer equal to one or more and w is an integer greater than one.

4,223,113

POLYESTER COMPOSITIONS WHICH CRYSTALLIZE RAPIDLY

Peter Bier, New Martinsville, W. Va., and Rudolf Binsack, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 875,015, Feb. 3, 1978, abandoned, and a continuation-in-part of Ser. No. 960,976, Nov. 15, 1978, abandoned, which is a continuation of Ser. No. 852,894, Nov. 18, 1977, abandoned. This application May 18, 1979, Ser. No. 40,387

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653120; Feb. 14, 1977, 2706128

Int. Cl.² C08G *63/76*

U.S. Cl. 525—439 **19 Claims**

1. A thermoplastic composition which crystallizes rapidly, comprising

(a) a high molecular weight polyalkylene terephthalate which has an intrinsic viscosity of at least about 0.4 dl/g (measured as a 0.5% strength by weight solution in a phenol/tetrachloroethane mixture in a weight ratio of 1:1 at 25° C.) and

(b) about 0.5 to 30% by weight based on the weight of (a) and (b) of an oligomeric polyester having a minimum polymerization degree of 2 and a maximum number-average molecular weight of about 6000, said oligomer being free of any substituents which are substantially reactive with said high molecular weight polyalkylene terephthalate under injection molding conditions.

4,223,114

PROCESS FOR THE PRODUCTION OF BEAD POLYMERS

Carlhans Süling, Odenthal; Gerhard Balle, Leverkusen; Michael Walkowiak, Cologne, and Hans-Hermann Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,979

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741196

Int. Cl.² C08L *75/00*

U.S. Cl. 525—440 **20 Claims**

1. A two-phase bead polymer having an average bead diameter of from 10μ to 150μ comprising

(A) 88% to 99.5% by weight of a polymer of polymerised units of at least one methacrylic acid ester containing from 1 to 10 carbon atoms in the aliphatic, saturated alcohol component; and

(B) 0.5% to 12% by weight of a monomer-soluble polyurethane which has been obtained from (1) at least one dihydroxy compound, (2) a diisocyanate from the group comprising (a) aliphatic diisocyanates having a branched carbon skeleton of 7 to 26 carbon atoms, (b) isophorone diisocyanate and (c) aliphatic or cycloaliphatic diisocyanates modified by radical graft copolymerisation with vinyl monomers, (3) an aliphatic or cycloaliphatic diamine and (4) a monofunctional chain terminator.

4,223,115
STRUCTURAL ADHESIVE FORMULATIONS

Denis J. Zalucha, Waterford; Frederick H. Sexsmith, Erie; Ernest C. Hornaman, Girard, and Terrance H. Dawdy, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Apr. 24, 1978, Ser. No. 899,621
Int. Cl.[3] C08K 5/52, 5/53
U.S. Cl. 525—455 **74 Claims**

1. A room temperature-curable adhesive system comprising

(A) as a polymerizable adhesive composition, a mixture consisting essentially of

(a) from about 10 to about 90 percent by weight of at least one polymerizable material selected from the group consisting of styrene, methyl methacrylate, ethyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, hexyl methacrylate, ethylhexyl methacrylate, partially polymerized syrup of one or more of such monomers, such syrup containing both polymer and unpolymerized monomer, and mixtures thereof;

(b) from about 10 to about 90 percent by weight of at least one reaction product of at least one isocyanate-functional prepolymer and at least one hydroxy-functional monomer having at least one unit of polymerizable olefinic unsaturation, such reaction product being characterized by the presence of at least two units of olefinic unsaturation and the substantial absence of free isocyanate group;

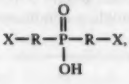
(c) from about 0.5 to about 30 percent by weight of acrylic acid or methacrylic acid;

(d) from zero to about 20 percent by weight of at least one polymerizable olefinically unsaturated monomer, the amount of said monomer being in addition to the amount of any such monomer employed in (A) (a);

(e) from zero to about 40 percent by weight of at least one elastomeric polymeric material having a second order glass transition temperature below about 5° C.;

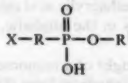
the respective percentages of (a)–(e) being based on the total weight of (a)–(e);

(f) an effective amount of at least one phosphorus-containing compound having the formulae



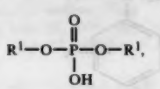
I.

wherein each R is the same or different, and each R is independently a divalent organic radical directly bonded to the phosphorus atom through a carbon-phosphorus bond, said divalent radical being selected from the group consisting of divalent unsubstituted organic radical and divalent organic radical having at least one substituent group selected from the class consisting of halogen, hydroxyl, amino, alkyl radical containing from 1 to 80 carbon atoms and aryl radical having at least one moiety containing at least one aromatic nucleus; and wherein each X is the same or different, and each X is independently a functional group selected from the class consisting of hydrogen, hydroxyl, amino, mercapto, halogen and CH=C<;



II.

wherein R and X are as previously defined; and R^1 is hydrogen or $—R^2—X$, wherein R^2 is a divalent organic radical directly bonded to the oxygen radical through a carbon-oxygen bond, said divalent radical R^2 being selected from the group having at least one substituent group selected from the class consisting of halogen, hydroxyl, amino, alkyl radical containing from 1 to 8 carbon atoms and aryl radical having at least one moiety containing at least one aromatic nucleus and X is as previously defined; and

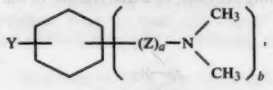


III.

wherein R^1 is as previously described;

(g) an effective amount of at least one reducing agent;

(h) from zero to about 10 percent by weight of polymerizable adhesive composition of at least one tertiary amine having the formula



V.

wherein Z is methylene; Y is selected from the group consisting of hydrogen, hydroxy, amino, halogen, alkyl radical having from one to 8 carbon atoms, and alkoxy radicals wherein the alkyl moiety has from one to 8 carbon atoms; a is zero or one; and b is one or two;

(i) from zero to about 15 percent by weight of polymerizable adhesive composition of a mixture of a metal molybdate selected from the group consisting of zinc molybdate, calcium molybdate, barium molybdate, strontium molybdate and mixtures thereof and a metal phosphate selected from the group consisting of zinc phosphate, calcium phosphate, magnesium phosphate and mixtures thereof; said metal molybdate being present on a volume concentration basis of from about 2 to about 3 parts per part of said metal phosphate; and

(j) from zero to about 15 percent by weight of polymerizable adhesive composition of at least one compound selected from the group consisting of polybasic lead salts of phosphorous acid, polybasic lead salts to saturated organic dicarboxylic acids and acid anhydrides, polybasic lead salts of unsaturated organic dicarboxylic acids and acid anhydrides, zinc oxide, and mixtures thereof;

the percentage of (a)–(e) being 100 minus the combined percentages of (f)–(j); and

(B) as a bonding accelerator an effective amount of at least one oxidizing agent, said oxidizing agent being reactive at room temperature with said reducing agent to generate free radicals effective to initiate addition polymerization of said polymerizable adhesive composition.

4,223,116
CONJUGATED DIENE POLYMERIZATION PROCESS AND CATALYST

George A. Moczygemba, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 17, 1976, Ser. No. 697,004
Int. Cl.[2] C08F 4/14, 4/16, 36/06
U.S. Cl. 526—117 **7 Claims**

1. In the copolymerization of 1,3-butadiene and 1,3-cyclohexadiene, wherein the weight ratio of 1,3-butadiene to 1,3-cyclohexadiene comonomer is in the range of about 99:1 to about 1:99, under polymerization conditions wherein the temperature of polymerization is in the range of about −40° C. to about 120° C., with a catalytic amount of catalyst mixture consisting essentially of bis(1,5-cyclooctadiene)-nickel and at least one Lewis acid selected from the group consisting of titanium tetrachloride and boron trifluoride etherate, wherein the amount of bis(1,5-cyclooctadiene)-nickel is in the range of

about 0.5 to about 10 gram millimoles for every 100 grams of total comonomers and the molar ratio of the bis(1,5-cyclooctadiene)-nickel to Lewis acid is in the range of about 5:1 to about 1:20, the improvement comprising charging the 1,3-butadiene to the reaction zone prior to the charging of the 1,3-cyclo-hexadiene and charging the bis(1,5-cyclooctadiene)-nickel to the reaction zone prior to the charging of the 1,3-butadiene.

4,223,117

PROCESS FOR PRODUCING OLEFIN POLYMERS

Takezo Sano, Takatsuki; Akio Kobayashi, Suita, and Yasuharu Yamada, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 750,155, Dec. 13, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,841

Claims priority, application Japan, Dec. 18, 1975, 50-151571; Dec. 18, 1975, 50-151572; Dec. 18, 1975, 50-151573

Int. Cl.[2] C08F *4/02, 10/00*

U.S. Cl. 526—121 **11 Claims**

1. A process for the preparation of a solid catalyst component for olefin polymerization, which comprises

(1) (a) reacting an organomagnesium compound represented by the formula, R^1MgX and/or $(R^1)_2Mg$, wherein R^1 is an alkyl group having 1 to 20 carbon atoms, aryl or alkenyl group and X is a halogen atom, with an aluminum halogenide and/or silicon halogenide in an ethereal solvent at a temperature of −20° to 200° C., the molar ratio of said organomagnesium compound to said halogenide being 0.1:1 to 10:1, or

(1) (b) reacting an organomagnesium compound represented by the formula R^1MgX and/or $(R^1)_2Mg$, wherein R^1 and X are as defined above, with at least one hydroxide selected from the group consisting of magnesium hydroxide, calcium hydroxide, zinc hydroxide, and aluminum hydroxide in an ethereal solvent at a temperature of −20° to 200° C., the molar ratio of said organomagnesium compound to said hydroxide compound being 1:0.01 to 1:10, and reacting a reaction mixture thus obtained with an aluminum halogenide and/or silicon halogenide being in an ethereal solvent at a temperature of −20° to 200° C., the molar ratio of the organomagnesium compound to said halogenide being 0.1:1 to 10:1,

(2) filtering and drying the resulting reaction products thereby to obtain a solid carrier containing the adsorbed ether compound,

(3) supporting a titanium compound represented by the formula, $Ti(OR^5)_{4-p}X_p$, wherein R^5 is an alkyl group having 1 to 20 carbon atoms, cycloalkyl or phenyl group, X is a halogen atom and p is a number satisfying the formula, $0 \leqq p \leqq 4$, and/or a compound selected from the group consisting of vanadium tetrachloride, and oxyvanadium trichloride on said carrier at a temperature of −20° to 150° C., wherein the amount of said titanium and/or vanadium compound supported on said carrier is 0.01 to 30% by weight in terms of titanium and/or vanadium based on the total amount of the supported compound and the solid carrier.

4,223,118

PROCESS FOR PRODUCING POLYETHYLENES

Kazumi Tsubaki; Hiroshi Morinaga; Takeshi Iwabuchi, and Masao Kawahara, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Limited, Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,727

Claims priority, application Japan, Sep. 22, 1977, 52-113279

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—128 **7 Claims**

1. A process for producing polyethylene which comprises polymerizing ethylene with or without a comonomer in the presence of a catalyst consisting of an organometallic compound and a solid catalytic component (B) obtained by reacting a titanium or vanadium halide with a reaction product (A) obtained by reacting a Grignard reagent with an organosilicon compound selected from the group consisting of hydropolysiloxanes having structural units of

$$R^1_aH_bSiO_{(4-a-b/2)} \quad (I)$$

wherein R^1 represents an alkyl, aryl, aralkyl, alkoxy or aryloxy group; a is 0, 1 or 2; b is 1, 2 or 3; and $a+b \leqq 3$ and organosilicon compounds having the formula

$$R^3_nSi(OH)_{4-n} \quad (II)$$

wherein R^3 represents a C_1–C_{18} hydrocarbon moiety and n is 1, 2 or 3, and polycondensates of the compound (II) in the presence of one or more aluminum alkoxide having the formula

$$Al(OR^2)_nX_{3-n} \quad (III)$$

wherein R^2 represents a C_1–C_{12} alkyl group and X represents a halogen atom and $0 < n \leqq 3$.

4,223,119

HIGH SOLIDS COMPOSITIONS CONTAINING ESTER DIOL ALKOXYLATE AND ORGANIC POLYISOCYANATE

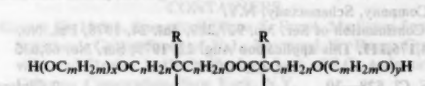
Joseph V. Koleske, Charleston; Robert J. Knopf, Saint Albans, and Oliver W. Smith, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 837,731, Sep. 29, 1977, Pat. No. 4,158,652. This application Feb. 26, 1979, Ser. No. 15,423

Int. Cl.[2] C08G *18/06*

U.S. Cl. 528—66 **4 Claims**

1. A high solids composition comprising a blend of (I) an ester diol alkoxylate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers each having a value of from 1 to 20 and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms and (II) from 10 to 300 weight percent thereof of an organic polyisocyanate.

4,223,120

TERPOLYMERS OF MALEIC ANHYDRIDE AND THEIR USE AS SCALE CONTROL AGENTS

Stephen R. Kurowsky, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 822,097, Aug. 5, 1977, abandoned, which is a division of Ser. No. 780,483, Mar. 23, 1977, Pat. No. 4,065,607. This application Dec. 8, 1978, Ser. No. 967,698

Int. Cl.[2] C08F *4/00, 2/06, 22/00;* C23F *10/00*

U.S. Cl. 526—208 **2 Claims**

1. A process for preparing a copolymer consisting essentially of 30 to 70 mole % maleic anhydride and 30 to 70 mole % of acrylamide or methacrylamide, said copolymer being characterized by a relative viscosity of about 1.02 to 0.10 in dimethylsulfoxide at a concentration of 0.5 per deciliter and by a solubility of less than 0.10 g per g of water at ambient temperature, said process comprising heating a mixture of maleic anhydride and acrylamide or methacrylamide in a chain transfer solvent mixture to at least 120° C., introducing from 2 to 20 weight % free radical initiator and continuing to maintain said mixture at a temperature of at least about 120° C. until polymerization is essentially complete and a granular non-agglomerated polymer is produced, said chain transfer solvent mixture containing 15 to 85 weight % aromatic solvent selected from the group consisting of mono and dialkyl substituted benzene having

from 1 to 4 carbon atoms in each alkyl group and trialkyl substituted benzene having from 1 to 2 carbon atoms in each alkyl group, and 15 to 85 weight % ketone solvent selected from the group consisting of dialkyl ketone having from 1 to 5 carbon atoms in each alkyl group and cycloalkyl ketone having from 5 to 8 carbon atoms in the cycloalkyl group.

4,223,121

ORGANOPOLYSILOXANE RESINS OF INCREASED HARDNESS

Alfred J. Burzynski, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 4, 1978, Ser. No. 966,421
Int. Cl.[2] C08G 77/06
U.S. Cl. 528—12 **12 Claims**

1. In a process for preparing an organopolysiloxane by hydrolyzing a trialkoxysilane in aqueous solution containing at least the stoichiometric amount of water required for said hydrolysis up to a water to silane molar ration of about 10 and having an acid pH, and then heating the solution at an elevated temperature to condense the hydrolyzed silane to an organopolysiloxane, the improvements comprising using formic acid in said solution to form said acid pH and at a strength within the range of about 4800 ppm to about 300,000 ppm.

4,223,122

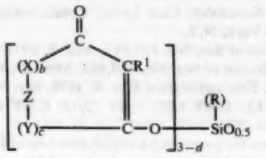
MOISTURE CURABLE ORGANOPOLYSILOXANES

James A. Cella, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 927,289, Jul. 24, 1978, Pat. No. 4,176,111. This application Aug. 22, 1979, Ser. No. 68,635
Int. Cl.[2] C08G 77/04
U.S. Cl. 528—30 **2 Claims**

1. Moisture curable organopolysiloxane compositions comprising an organopolysiloxane consisting essentially of chemically combined units of the formula,

and having terminal siloxy units of the formula,



where R is a fluoroalkyl radical, R^1 is selected from hydrogen, halogen and R, X and Y are divalent radicals selected from —O—, —S— and

Z is a divalent $C_{(1-13)}$ organic radical selected from alkylene, cycloalkylene, arylene and a fused ring structure, b and c are equal to 0 or 1, R^2 is selected from hydrogen and R, and d is a whole number having a value of 0 or 1.

4,223,123

ALIPHATIC PHENOXY POLYPHTHALOCYANINE

Teddy M. Keller, Alexandria, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1979, Ser. No. 43,188
Int. Cl.[3] C08G 73/00, 79/00, 79/12
U.S. Cl. 528—210 **10 Claims**

1. A thermosetting resin comprising a polyphthalocyanine having a repeating unit selected from the class consisting of $PcO_4(CR'R'')_2Ph_4$, $M.PcO_4(CR'R'')_2Ph_4$, and $(MX.PcO_4(CR'R'')_2Ph_4$ wherein Pc represents the phthalocyanine nucleus, Ph represents the phenyl group, M represents a metal selected from the class consisting of copper, magnesium, zinc, iron, cobalt, nickel, palladium, platinum, manganese, chromium, molybdenum, vanadium, beryllium, silver, mercury, aluminum, tin, antimony, calcium, barium, cadmium, and mixtures thereof, MX represents a metal salt selected from the class consisting of stannous chloride, cuprous chloride, cuprous bromide, cuprous cyanide, cuprous ferricyanide, zinc chloride, zinc bromide, zinc iodide, zinc cyanide, zinc ferricyanide, zinc acetate, zinc sulfide, ferrous chloride, ferric chloride, ferrous ferricyanide, ferrous chloroplatinate, ferrous fluoride, ferrous sulfate, cobaltous chloride, cobaltic sulfate, cobaltous cyanide, nickel cyanide, nickel carbonate, stannic chloride and mixtures thereof, R' represents an alkyl radical with 1 to 6 carbon atoms, R'' represents hydrogen or an alkyl radical with 1 to 6 carbon atoms, and the phenyl groups are attached at the meta or para position.

4,223,124

METHOD FOR PRODUCING POLYESTERS CONTAINING LOW AMOUNTS OF ETHER BY-PRODUCTS

Roy M. Broughton, Auburn, Ala.; Joseph R. Thomas, New Martinsville, W. Va., and Terence E. Winters, Gates Mills, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 22, 1979, Ser. No. 51,097
Int. Cl.[2] C08G 63/16
U.S. Cl. 528—272 **23 Claims**

1. A process for reducing the glycol ether content formed during the esterification reaction in making a polyester, comprising the steps of:

adding to a heel solution in a vessel a dicarboxylic acid selected from the class consisting of alkyl dicarboxylic acids having from 2 to 16 carbon atoms, aryl dicarboxylic acids containing from 8 to about 16 carbon atoms, and alkyl substituted aryl dicarboxylic acids containing from 8 to about 16 carbon atoms;

conducting an esterification reaction by adding a glycol containing from 2 to 12 carbon atoms and heating said vessel to a temperature of from about 20° C. below the boiling point to about 100° C. above the boiling point of said glycol;

adding during the initial portion of said esterification reaction a deficient equivalent weight amount of said glycol so that an esterified acid solution having a low ether content is produced; and

retaining a portion of said esterfied acid solution as a heel solution.

13. A polyester having low glycol ether content produced according to a reaction comprising the steps of:

adding to a heel solution in a vessel a dicarboxylic acid selected from the class consisting of alkyl dicarboxylic acids having from 2 to 16 carbon atoms, aryl dicarboxylic acids containing from 8 to 16 carbon atoms, and alkyl substituted aryl dicarboxylic acids containing from 8 to about 16 carbon atoms;

conducting an esterification reaction by adding a glycol containing from 2 to 12 carbon atoms and heating said vessel to a temperature of from about 20° C. below the

boiling point to about 100° C. above the boiling point of said glycol;

adding during the initial esterification reaction a deficient equivalent weight amount of said glycol so that an esterfied acid having a low ether content is produced;

retaining a portion of said esterfied acid solution as a heel solution;

removing the remaining portion of said esterfied acid solution; and

condensing said remaining esterfied acid solution by drawing a vacuum and adding a catalyst to produce a polyester having a low ether content.

4,223,125

POLYESTER COMPOSITIONS WHICH CRYSTALLIZE RAPIDLY

Peter Bier, New Martinsville, W. Va., and Rudolf Binsack, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 875,015, Feb. 3, 1978, Continuation-in-part of Ser. No. 960,976, Nov. 15, 1978, abandoned, which is a continuation of Ser. No. 852,894, Nov. 18, 1977, abandoned. This application May 18, 1979, Ser. No. 40,386

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706128; Nov. 23, 1976, 2653120

Int. Cl.² C08G *63/18*

U.S. Cl. 528—305 **21 Claims**

1. A thermoplastic composition which crystallizes rapidly, comprising

(a) a high molecular weight polyalkylene terephthalate which has an intrinsic viscosity of at least about 0.4 dl/g (measured as a 0.5% strength by weight solution in a phenol/tetrachloroethane mixture in a weight ratio of 1:1 at 25° C.) and

(b) about 1.0 to 30% by weight, based on the weight of (a) and (b) of an esterification product of an aromatic carboxylic acid with 7 to 24 carbon atoms and alcohols selected from aliphatic, cycloaliphatic and araliphatic alcohols with 1 to 20 carbon atoms, said esterification product being monomeric and free of substituents substantially reactive with said high molecular weight polyalkylene terephthalate under injection molding conditions.

4,223,126

LINEAR COPOLYESTERS CONTAINING TERTIARY BUTYL ISOPHTHALIC ACID

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 2, 1979, Ser. No. 63,286

Int. Cl.² C08G *63/18*

U.S. Cl. 528—305 **10 Claims**

1. A polymethylene terephthalate t-butyl isophthalate copolyester in which the t-butyl isophthalate units comprise from 1 to 50 percent of the sum of the ethylene terephthalate and t-butyl isophthalate units in the copolyester and the ethylene terephthalate units comprise from 99 to 50 percent of said sum.

4,223,127

POLYAMIDES FROM 2,4'-DIAMINODICYCLOHEXYL METHANE

Rolf-Volker Meyer; Rolf Dhein, and Hans Rudolph, all of Krefeld-Uerdingen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,872

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753577

Int. Cl.² C08G *69/14*

U.S. Cl. 528—324 **9 Claims**

1. A film forming copolyamide obtained by condensing a mixture consisting of (I) from 10 to 98% by weight of a lactam containing at least 5 carbon atoms in the ring or a corresponding aminocarboxylic acid and

(II) from 2 to 90% by weight of equivalent quantities of

(a) an aliphatic dicarboxylic acid having from 2 to 20 carbon atoms, an aromatic dicarboxylic acid having from 8 to 20 carbon atoms or a mixture thereof and

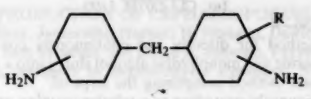
(b) a mixture containing

(i) from 70 to 95 mol % of 4,4'-diaminodicyclohexyl methane,

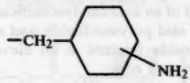
(ii) from 5 to 30 mol % of 2,4'-diaminodicyclohexyl methane,

(iii) from 0 to 2 mol % of 2,2'-diaminodicyclohexyl methane and

(iv) from 0 to 10 mol % of a triamine of the formula



wherein R is



4,223,128

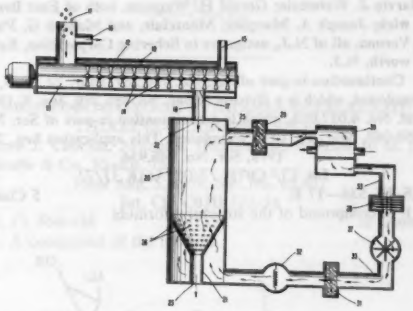
PROCESS FOR PREPARING POLYETHYLENE TEREPHTHALATE USEFUL FOR BEVERAGE CONTAINERS

George W. Halek, Summit; William T. Freed, Madison; Jerome S. Schaul, Caldwell, all of N.J.; Raymond W. Rupp, Greenville, and Stanley L. Pauls, Taylors, both of S.C., assignors to Celanese Corporation, New York, N.Y.

Filed May 16, 1978, Ser. No. 906,393

Int. Cl.² C08G *63/22*

U.S. Cl. 528—481 **15 Claims**



1. A process for reducing the acetaldehyde content and the generation rate of acetaldehyde of polyethylene terephthalate chip which has a crystallinity of at least about 30% in order to render the polyethylene terephthalate suitable for making containers, which process comprises stabilizing said polyethylene terephthalate by heating it at a temperature of about 180° to about 220° C. for from about 2 to about 20 hours in a countercurrent stream of air and maintaining an air to chip ratio at a predetermined value of at least about 0.8 standard cubic foot of air per minute/pound of polyethylene terephthalate per hour and at a vapor velocity of at least about 0.5 foot per second, said air having a dew point of less than about −30° C., in order to reduce the acetaldehyde level of said crystallized

polyethylene terephthalate to less than about 2.5 parts per million, to reduce the generation rate of acetaldehyde to less than about 3.0 parts per million per minute, and to increase the intrinsic visocity to a value in the range of from about 0.60 to about 0.95 deciliters per gram calculated from measurements made on an 8% by weight solution in o-chlorophenol at 25° C.

4,223,129

CONTINUOUS PROCESS FOR MAKING ALKYL ALDOSIDES FROM STARCH OR OTHER CARBOHYDRATES

Claris D. Roth; Kenneth B. Moser, and William A. Bomball, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 1, 1978, Ser. No. 938,750
Int. Cl.[2] C07H *1/00*
U.S. Cl. 536—4 **15 Claims**

1. A method for directly and continuously converting a polysaccharide and monohydric alcohol slurry into a glycoside mixture, said method comprising the steps of:

(a) continuously providing to a tubular reaction zone under a positive fluid pressure, a fluid feed slurry consisting essentially of polysaccharide, monohydric alcohol in an amount exceeding the polysaccharide weight and an effective amount of an acid catalyst sufficient to catalyze the conversion of said polysaccharide and monohydric alcohol to a glycoside mixture at an elevated temperature within said reaction zone;

(b) heating said feed slurry within said continuous tubular reaction zone to an elevated temperature for a period of time sufficient to convert said fluid slurry into a fluid glycoside mixture while continuously providing additional feed slurry to said tubular reaction zone under a positive fluid pressure to force the converted fluid glycoside mixture through said tubular reaction zone; and

(c) rapidly cooling and recovering the converted glycoside mixture from said tubular reaction zone.

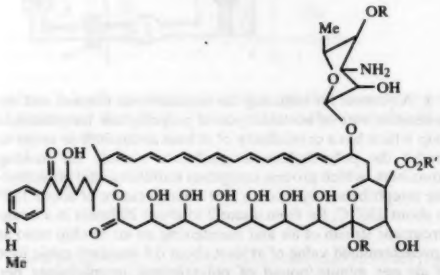
4,223,130

ANTIBIOTIC 67-121, A POLYENE ANTIFUNGAL ANTIBIOTIC PRODUCED BY *ACTINOPLANES CAERULEUS*

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick; Joseph A. Marquez, Montclair, and Mahesh G. Patel, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 780,207, Mar. 22, 1977, abandoned, which is a division of Ser. No. 585,289, Jun. 9, 1975, Pat. No. 4,027,015, which is a continuation-in-part of Ser. No. 450,040, Mar. 11, 1974, abandoned. This application Sep. 28, 1978, Ser. No. 946,934
Int. Cl.[2] C07H *17/08*; A61K *31/71*
U.S. Cl. 536—17 R **5 Claims**

1. A compound of the structural formula



and the non-toxic pharmaceutically acceptable salts thereof, wherein R is selected from the group consisting of hydrogen and 1-0-β-D-mannosyl, and R' is a lower alkyl radical having 1 to 4 carbon atoms.

4,223,131

25-HYDROXYCHOLECALCIFEROL-26,23-LACTONE

Hector F. DeLuca; Heinrich K. Schnoes, and Joseph K. Wichmann, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 26, 1979, Ser. No. 7,473
Int. Cl.[2] C07D *307/32*
U.S. Cl. 542—428 **1 Claim**

1. 25-hydroxycholecalciferol-26,23-lactone in substantially pure form.

4,223,132

SELECTIVE CONVERSION OF BENZYL ALCOHOL CARBOXYLATES TO THE FREE ACID FORM

Teruji Tsuji, Takatsuki; Mitsuru Yoshioka, Toyonaka; Takahiro Kataoka, Shiga; Yuji Sendo, Itami; Shoichi Hirai, Ibaraki; Takashi Maeda, Kobe, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 773,962, Mar. 3, 1977, abandoned. This application Jul. 25, 1977, Ser. No. 818,597
Claims priority, application Japan, Mar. 3, 1976, 51-23602
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—16 **11 Claims**

1. A process for preparing a free carboxylic acid from a benzyl alcohol ester which comprises treating a carboxylate of benzyl alcohol or a carboxylate of a benzyl alcohol substituted by C_1 to C_5 alkyl, C_1 to C_5 alkoxy, C_5 to C_{10} aryloxy, C_1 to C_{12} acyloxy, hydroxy, C_1 to C_5 alkylamino, C_1 to C_8 acylamino, amino, carboxy, C_2 to C_6 carbalkoxy, carbamoyl, or halogen, with a Lewis acid selected from at least one member of the group consisting of boron trihalides, titanium tetrahalides, zirconium tetrahalides, tin tetrahalides, antimony halides, bismuth trichloride, aluminum trihalides, zinc halides, ferric halides and zinc sulfate, in a solvent at a temperature of from about −10° C. to 100° C.

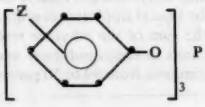
4,223,133

CEPHALOSPORIN REDUCTION PROCESS

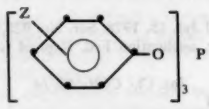
Charles A. Bunnell, Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 1, 1979, Ser. No. 8,645
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—16 **77 Claims**

1. A process for reducing a cephalosporin sulfoxide to the corresponding cephalosporin which comprises reacting said cephalosporin sulfoxide with about 1.0 to about 1.3 equivalents of a triaryl phosphite-halogen complex of the formula



wherein X is Cl or Br, and Z is hydrogen, halo, C_1–C_4 alkyl or C_1–C_4 alkoxy, which is the kinetically controlled product of the reaction of equivalent amounts of a triaryl phosphite of the formula



and chlorine or bromine in an inert organic solvent,

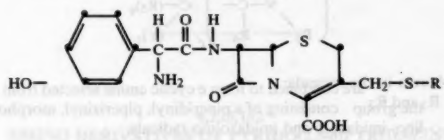
in the presence of at least 1 equivalent of a halogen scavenger in a substantially anhydrous inert organic solvent at a temperature of about 30° C. or below; provided that when the cephalosporin sulfoxide has a free amino, hydroxy or carboxy group on the C-7 substituent, those groups are first protected by conventional amino, hydroxy or carboxy protecting groups.

4,223,134
PROCESS FOR PREPARING CEPHALOSPORIN ANTIBIOTICS

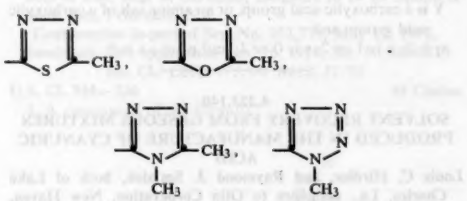
Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 670,487, Mar. 25, 1976, Pat. No. 4,148,817. This application Nov. 28, 1978, Ser. No. 964,402
Int. Cl.² C07D *501/04*
U.S. Cl. 544—26 3 Claims

1. In the process for preparing a compound of the formula

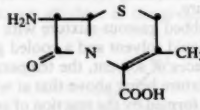


wherein R is



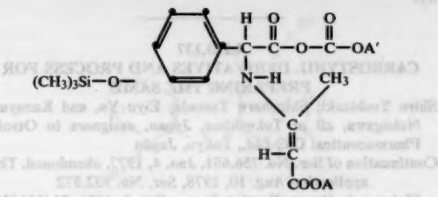
which comprises

(1) acylating a 7-amino nucleus compound of the formula



with an amino-protected 3- or 4-hydroxyphenylglycine; and

(2) removing the amino-protecting group from the acylation product; the improvement which comprises acylating the 7-amino nucleus compound with the mixed anhydride of a trimethylsilyl ether of an amino-protected phenylglycine compound of the formula



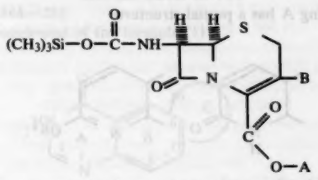
wherein A and A′ are methyl or ethyl.

4,223,135
PRODUCTION OF CEPHALOSPORINS

Derek Walker, Jamesville; Herbert H. Silvestri, Dewitt; Chester Sapino, East Syracuse, and David A. Johnson, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,511
Int. Cl.² C07D *501/04*
U.S. Cl. 544—30 20 Claims

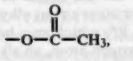
1. A compound having the formula



wherein B is —CH_2E;

A is $(CH_3)_3Si$— or an easily cleavable ester protecting group; and

E is hydrogen or

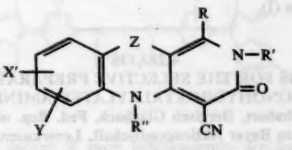


4,223,136
2,3-DIHYDRO-3-OXO-5H-PYRIDO[3,4-B][1,4]-BENZOTHIAZINE-4-CARBONITRILES

Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Aug. 3, 1979, Ser. No. 63,607
Int. Cl.² C07D *513/14*
U.S. Cl. 544—34 23 Claims

1. A compound of the formula



wherein R represents hydrogen or a straight-chain alkyl containing 1 to 3 carbon atoms; R′ and R″ each represent hydrogen or straight-chain or branched-chain alkyl containing 1 to 3 carbon atoms; X′ represents hydrogen, fluorine, chlorine, bromine, nitro, or straight-chain or branched-chain alkoxy containing 1 to 4 carbon atoms; when X′ is other than alkoxy, Y represents hydrogen and, when X′ is alkoxy, Y is hydrogen

or the same alkoxy; and Z represents sulfur, sulfinyl, or sulfonyl.

4,223,137

CARBOSTYRIL DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Shiro Yoshizaki; Shigeharu Tamada; Eiyu Yo, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

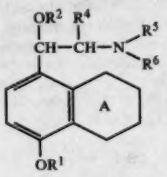
Continuation of Ser. No. 756,651, Jan. 4, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,572

Claims priority, application Japan, Oct. 8, 1976, 51/121423

Int. Cl.[2] C07D *215/26, 215/32*

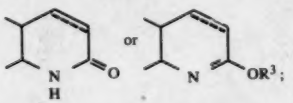
U.S. Cl. 544—128 **38 Claims**

1. A carbostyril compound represented by the formula (I):



(I)

and the ring A has a partial structure:



wherein R^1, R^2 and R^3, which may be the same or different, each represents a hydrogen atom, a cycloalkylcarbonyl group having 4 to 8 carbon atoms, a cycloalkylalkanoyl group having 3 to 7 carbon atoms in the cycloalkyl moiety and 2 to 4 carbon atoms in the alkanoyl moiety, a benzoyl group, an alkanoyl group having 2 to 6 carbon atoms or a phenylalkylcarbonyl group having 1 to 4 carbon atoms in the alkyl moiety; R^4 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R^5 and R^6, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a cycloalkyl group having 4 to 6 carbon atoms, or a phenylalkyl group having 1 to 4 carbon atoms in the alkyl moiety, or R^5 and R^6 may, when taken together with the nitrogen atom to which they are attached, form a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino and piperazino, which heterocyclic ring can be unsubstituted or substituted with an alkyl group having 1 to 4 carbon atoms; with the proviso that at least one of R^1, R^2 and R^3 represents said cycloalkylcarbonyl group, said cycloalkylalkanoyl group, said benzoyl group, said alkanoyl group, or said phenylalkylcarbonyl group and each of R^1 and R^2 is not a hydrogen atom when R^3 is absent; and pharmaceutically acceptable acid addition salts of said carbostyril compounds of the formula (I).

4,223,138

PROCESS FOR THE SELECTIVE PREPARATION OF MONOHYDROXYALKYLATED AMINES

Rüdiger Schubart, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,562

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716946

Int. Cl.[2] C07C *89/02*

U.S. Cl. 544—162 **10 Claims**

1. In a process for the selective preparation of a monohydroxyalkylated amine by reacting an amine with an epoxide, the improvement which comprises vaporizing said amine in a collection vessel and causing the vapors thereof to pass upwardly through a defined reaction zone into a condensation zone, condensing said amine vapors in said condensation zone and causing liquid amine in said condensation zone to pass downwardly into said defined reaction zone and toward said collection zone, retarding the passage of said liquid amine through said defined reaction zone, directing epoxide against the retarded amine and passing the thus-formed aminoethanol into said collection vessel by directing condensed amine thereagainst.

4,223,139

AMINE SALTS OF TERTIARY AMINO ACIDS

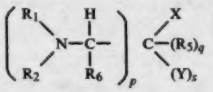
Ibrahim S. Bechara, Boothwyn; Rocco L. Mascioli, Media, and Philip J. Zaluska, Schnecksville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 746,313, Dec. 1, 1976, Pat. No. 4,134,994. This application Oct. 23, 1978, Ser. No. 953,830

Int. Cl.[3] C07D *295/10, 295/14*

U.S. Cl. 544—171 **5 Claims**

1. An amine salt of a tertiary amino acid represented by the formula:



wherein in the formula:

R_1 and R_2 are combined to form e cyclic amine selected from the group consisting of a piperidinyl, piperizinyl, morpholino, imidazolo and imidazolino radicals;

R_5 is hydrogen;

R_6 is hydrogen or a phenyl;

X is an amine salt of carboxylic acid group;

Y is a carboxylic acid group, or an amine salt of a carboxylic acid group; and

q is 1; p is 1 or 2; s is 0 or 1; and p+q+s is 3.

4,223,140

SOLVENT RECOVERY FROM GASEOUS MIXTURES PRODUCED IN THE MANUFACTURE OF CYANURIC ACID

Louis C. Hirdler, and Raymond J. Smialek, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 20, 1979, Ser. No. 68,127

Int. Cl.[2] C07D *251/32*

U.S. Cl. 544—192 **8 Claims**

1. A process for solvent recovery from a hot gaseous mixture comprised of ammonia, carbon dioxide, cyanuric acid particles, and solvent vapors, said solvent having a boiling point in the range of from about 150° to about 300° C., said process which comprises:

(a) scrubbing said hot gaseous mixture with liquid solvent to remove said cyanuric acid particles and to form a scrubbed gaseous mixture,

(b) cooling said scrubbed gaseous mixture with a coolant to form condensed liquid solvent and a cooled gaseous mixture containing traces of solvent, the temperature of said cooled gaseous mixture being above that at which ammonium carbamate is formed by the reaction of said ammonia with said carbon dioxide,

(c) separating said condensed liquid solvent from said cooled gaseous mixture, and

(d) contacting said cooled gaseous mixture with additional liquid solvent to remove said traces of solvent from said cooled gaseous mixture to form a substantially solvent-free gaseous mixture.

4,223,141
PREPARATION OF METHOXY-METHYL MELAMINES

Hans Hönel; Karlfried Keller; Walter Michel, all of Frankfurt am Main, and Manfred Schön, Rodgau, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,851

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839713

Int. Cl.[2] C07D *251/64*

U.S. Cl. 544—196 10 Claims

1. The process for manufacture of methanol-etherified methylolmelamines which are largely monomeric containing more than 5 mols of formaldehyde and more than 4 mols of methyl-etherified methylol groups, per mol of melamine, and having a viscosity of less than 20 pascal-seconds at 25° C. and a solids content of at least 95%, comprising (a) methylolating melamine with formaldehyde at a molar melamine:formaldehyde ratio of 1:6.5 to 1:8 for 1½ to 5 hours at 50° C. to 85° C., with the formaldehyde source being an aqueous solution of formalin containing 30 to 50% by weight of formaldehyde and having a pH of 6.7 to 7.3, and (b) etherifying the resulting suspension of methylolmelamine with 15 to 30 mols of methanol per mol of melamine at temperatures of 30° C. to 60° C. in the presence of a strong acid.

4,223,142
AMINO DERIVATIVES OF PYRIDO(2,3-d)PYRIDAZINE CARBOXYLIC ACIDS AND ESTERS

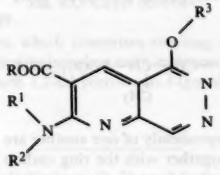
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 252,775, May 12, 1972, abandoned. This application Jun. 16, 1976, Ser. No. 696,615

Int. Cl.[3] C07D *471/04;* A61K *31/50*

U.S. Cl. 544—236 14 Claims

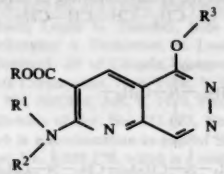
1. A compound of the formula



wherein R is hydrogen or lower alkyl, R^1 and R^2 each is hydrogen, lower alkyl, phenyl, substituted phenyl, wherein the phenyl substituent is one or two of the groups lower alkyl, trifluormethyl or carboxy, phenyl-lower alkylene, di-lower alkylamino-lower alkylene or the group

is a pyrrolidine, piperidino, pyrazolyl, pyrimidinyl, pyrazinyl, dihydropyridazinyl or piperazinyl radical each of which may bear one hydroxy-lower alkyl group or one or two lower alkyl groups, and R^3 is hydrogen or lower alkyl, and phsyiologically acceptable acid addition salts thereof.

8. A compound of the formula



wherein R and R^3 each is hydrogen or lower alkyl, R^1 and R^2 each is hydrogen, lower alkyl, phenyl, substituted phenyl, wherein the phenyl substituent is one or two of the groups lower alkyl, trifluoromethyl or carboxy, phenyl-lower alkylene, or di-lower alkylamino-lower alkylene, and physiologically acceptable acid addition salts thereof.

4,223,143
QUINAZOLINE DERIVATIVES

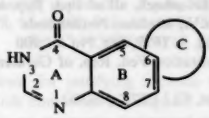
Eckehard K. T. Cuny, Seeheim, and Frieder W. Lichtenthaler, Mühltal, both of Fed. Rep. of Germany, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed Dec. 11, 1978, Ser. No. 968,577

Int. Cl.[2] C07D *487/04*

U.S. Cl. 544—251 7 Claims

1. A compound of the formula (1)



(1)

wherein ring C is a pyrazole ring fused to ring B of said formula (1) in two vicinal positions of ring B selected from the group consisting of vicinal positions 5/6, 6/7 and 7/8 of ring B.

4,223,144
TRIPHENYLMETHANE DYES

Hellmut Kast, Bobenheim-Roxheim; Klaus Grychtol, Bad Durkheim, and Franz Feichtmayr, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

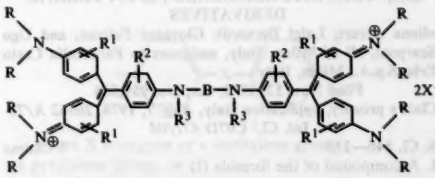
Filed Sep. 5, 1978, Ser. No. 939,695

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2739953

Int. Cl.[2] C07D *295/12*

U.S. Cl. 544—392 8 Claims

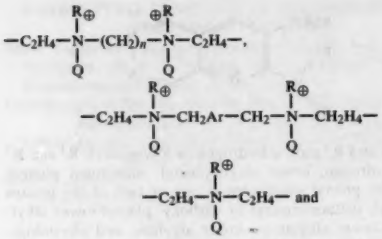
1. A triphenylmethane dye of the general formula:



wherein radical R each independently are hydrogen or substituted or unsubstituted alkyl, or the two R radicals together with the nitrogen atom form a saturated heterocyclic 5-membered or 6-membered ring; radicals R^1 each independently are hydrogen or C_1–C_4 alkyl;

radicals R^2 each independently are hydrogen, C_1–C_4 alkyl or halogen; radicals R^3 each independently are hydrogen, or substituted or unsubstituted alkyl or taken together with the two nitrogen atoms to which they are attached and

bridging member B are piperazino; and B is a member selected from the group consisting of $-(CH_2)_n-$, $-CH_2Ar-CH_2-$, $-CH_2-CH=CH-CH_2-$,



$-C_2H_4OCONH-Ar-NHCOOC_2H_4-$, wherein

Ar is phenylene, diphenylene or naphthylene each of which is unsubstituted or substituted by chlorine, methyl or methoxy, n is an integer from 2 to 8, Q is methyl, ethyl or benzyl and R is as defined above, and $X^{\ominus}$ is an anion.

4,223,145

PROCESS FOR THE PREPARATION OF ORGANIC MONO- AND POLYISOCYANATES

Peter Hentschel, Laudenbach; Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Aug. 1, 1979, Ser. No. 62,900

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837341

Int. Cl.[2] C07C *118/00*

U.S. Cl. 546—107 **7 Claims**

1. In a process for preparation of organic mono- and polyisocyanates of the general formula $R(NCO)_n$, wherein R is an optionally substituted aliphatic, cycloaliphatic, aromatic or heterocyclic residue and n is 1, 2 or 3, through thermal decomposition of a trisubstituted urea of the general formula $R(NHCONR'R'')_n$, wherein R' and R'' are the same or different optionally substituted aliphatic hydrocarbon residue of from 1 to 4 carbon atoms,

the improvement comprising

forming a hydrogen chloride adduct of said trisubstituted urea, which at minimum contains a stoichiometric amount and at maximum a 10 mole-% excess of HCl; and

carrying out the thermal decomposition in a melt or in the presence of an inert organic solvent in a closed system at a temperature between about 80° and 180° C.

4,223,146

4,5,6,7-TETRAHYDROIMIDAZO-[4,5-c]-PYRIDINE DERIVATIVES

Giuliana Arcari; Luigi Bernardi; Giovanni Falconi, and Ugo Scarponi, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

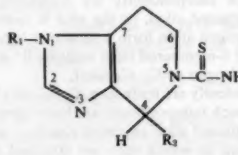
Filed Nov. 13, 1978, Ser. No. 959,506

Claims priority, application Italy, Aug. 7, 1978, 26562 A/78

Int. Cl.[2] C07D *471/04*

U.S. Cl. 546—118 **5 Claims**

1. A compound of the formula (I):



(I)

wherein R_1 is methyl or ethyl; R_2 is hydrogen or ethyl; and R_3 is methyl or isopropyl.

4,223,147

METHYLOL DERIVATIVES OF 2,2,6,6-TETRAALKYLPIPERIDINES AND THEIR PRODUCTION

Harald Oertel, Odenthal; Paul Uhrhan; Reinhard Lantzsch, both of Cologne; Ernst Roos, Odenthal; Hans Schröer, Dormagen, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

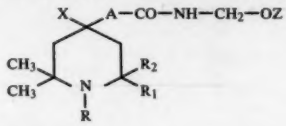
Filed Sep. 19, 1977, Ser. No. 834,763

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642446

Int. Cl.[2] C07D *211/58*

U.S. Cl. 546—224 **5 Claims**

1. A compound of the formula



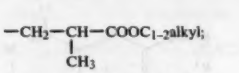
wherein

A is

wherein R_3 is C_1-C_{20}-alkyl, hydrogen, C_5-C_{12}-cycloalkyl or C_7-C_{12}-aralkyl and E is a direct bond;

Z is hydrogen or C_1-C_{14}-alkyl;

R is hydrogen, C_1-C_{20}-alkyl, C_3-C_5-alkenyl; C_7-C_{12}-aralkyl; CH—CHR_6—OH, wherein R_6 is hydrogen, methyl, or phenyl; $-CH_2CH_2CN$; $-CH_2-CH_2-COOC_{1\text{-}2}$alkyl; or



R_1 and R_2 independently of one another are C_1-C_6-alkyl, or R_1 and R_2 together with the ring carbon atom to which they are attached form C_1-C_7-cycloalkyl; and

X is hydrogen.

4,223,148

POLYALKYL-PIPERIDINE DIOLS AND PROCESS FOR THEIR PREPARATION

Hartmut Wiezer, Gersthofen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

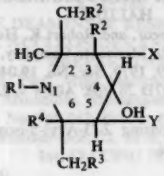
Filed Aug. 29, 1979, Ser. No. 70,805

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838364

Int. Cl.[2] C07D *471/10, 211/12*

U.S. Cl. 546—242 **5 Claims**

1. A polyalkyl-piperidine diol of the formula


(I),

in which

X and Y are different and stand each for a hydroxyl group or a hydrogen atom;

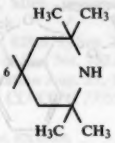
R^1 is hydrogen, oxygen or C_1–C_{12}-alkyl,

R^2 and R^3 are either identical and stand each for hydrogen or a C_1–C_5 alkyl group,

R^4 being a methyl group in this case; or

R^2 is hydrogen or C_1–C_5 -alkyl, and

R^3 and R^4 together with the carbon atoms to which they are linked form a C_5-or C_6-cycloalkyl group, or a group of the formula



2. A compound as claimed in claim 1, in which R^1 is hydrogen or methyl, R^2 and R^3 are hydrogen, and 4 is methyl.

4,223,149

PROCESS FOR PRODUCING 3-CYANO-5-(PYRIDINYL)-2(1H)-PYRIDINONES

Chester J. Opalka, Jr., and George Y. Lesher, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jul. 26, 1979, Ser. No. 60,758

Int. Cl.² C07D *401/04*

U.S. Cl. 546—257 **5 Claims**

1. The process which comprises reacting α-(pyridinyl)-β-[di-(lower-alkyl)amino]acrolein with malononitrile in a lower alkanol to produce 1,2-dihydro-2-oxo-5-(pyridinyl)nicotinonitrile.

4,223,150

PROCESS FOR PREPARING 1,1′-DIALKYL-4,4′-BIPYRIDYLIUM DIHALIDE

Ming F. Chen, Taichung, Taiwan, assignor to Cheng Hong Chemical Co., Ltd., Taichung, Taiwan

Filed Oct. 10, 1978, Ser. No. 949,529

Int. Cl.² C07D *213/22*

U.S. Cl. 546—258 **3 Claims**

1. A process for preparation of 1,1′-dialkyl-4,4′-bipyridylium dihalide which comprises reacting 4,4′-bipyridyl with an α-halogen substituted organic acid of the general formula: XR_1COOH, wherein X is Cl or Br in the α position, R_1 is a C_1-C_3 alkylene group, at a temperature from about 120° C. to 130° C. in the presence of water in an amount of from about 0.5–10 times that of the 4,4′-bipyridyl and positively controlling and terminating the reaction at a PH value of from about 2.0 to below 4.0.

4,223,151

PROCESS FOR PREPARING POLYCYCLIC HETEROCYCLES HAVING A PYRAN RING

Thomas A. Dobson; Leslie G. Humber, both of Dollard des Ormeaux; Christopher A. Demerson, St. Laurent, and Ivo L. Jirkovsky, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 504,086, Jun. 5, 1975, Pat. No. 4,021,451, which is a division of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sep. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, Jun. 1, 1971, Pat. No. 3,843,681. This application Feb. 3, 1977, Ser. No. 765,169

Claims priority, application South Africa, May 16, 1972, 72/3344

Int. Cl.² C07D *405/00*; A01N *9/00*

U.S. Cl. 546—269 **1 Claim**

1. 4-(6,7-Dimethoxy-1-methylisochroman-1-yl)pyridine.

4,223,152

PROCESS FOR PURIFYING CRUDE ISOINDOLINONE SERIES PIGMENTS

Osamu Fujii; Misao Takano; Takeshi Uotani, and Eiji Iwamoto, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Nanyo, Japan

Filed Apr. 3, 1979, Ser. No. 26,663

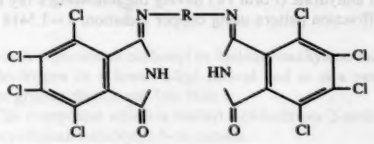
Claims priority, application Japan, Apr. 5, 1978, 53-39262; Apr. 28, 1978, 53-49909; Dec. 15, 1978, 53-154213

Int. Cl.² C07D *213/61, 209/50*

U.S. Cl. 546—273 **14 Claims**

1. A process for purifying a crude isionodolinone series pigment which comprises the steps of:

dispersing in an aromatic compound which is an aromatic hydrocarbon, halogenated aromatic hydrocarbon or nitrobenzene, a crude isoindolinone pigment represented by the following general formula:

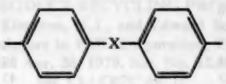


wherein R represents

an unsubstituted phenylene or diphenylene group,

a phenylene or diphenylene group substituted by chlorine atoms, methyl groups or methoxy groups,

a group expressed by the formula



where X is oxygen or a methylene group,

a pyridylene group, or

a direct bond

incorporating in the crude isoindolinone pigment dispersion (a) an alcoholate or hydroxide of an alkali metal and (b) at least one compound selected from the group consisting of a lower alcohol having 1 to 4 carbon atoms and water, thereby forming an alkali metal salt of the isoindolinone pigment; and then,

hydrolyzing the so-formed alkali metal salt of the isoindolinone pigment with acid.

4,223,153
CRYSTALLINE FORMS OF N-2-(6-METHOXY)BENZOTHIAZOLYL N'-PHENYL UREA

Lewis C. Lappas, Carmel; Leslie J. Lorenz, Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 9, 1979, Ser. No. 10,553
Int. Cl.[2] C07D *277/84*
U.S. Cl. 548—163 3 Claims

1. Stable crystalline forms of N-2-(6-methoxy)benzothiazolyl-N'-phenylurea of the group consisting of a monohydrate (Form III) having the following x-ray powder diffraction pattern using copper radiation, $\lambda = 1.5418$

"d" Value (A)	Intensities (I/I_1)
15.63	74
6.41	29
6.02	60
5.21	10
5.02	7
4.71	12
4.15	21
4.04	3
3.77	10
3.54	40
3.39	100
3.15	3
2.95	2
2.68	9
2.25	7
2.15	2
2.11	2
1.79	2
1.76	2

and an anhydrate (Form IV) having the following x-ray powder diffraction pattern using copper radiation, $\lambda = 1.5418$

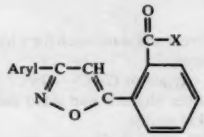
"d" value (A)	Intensities (I/I_1)
15.88	100
8.38	4
5.64	24
5.24	64
4.98	8
4.75	6
4.48	7
4.29	4
4.03	4
3.74	39
3.63	43
3.53	78
3.46	43
3.35	29
3.23	14
3.10	6
2.75	11
2.60	4
2.38	4
2.16	8
1.99	2
1.85	1
1.82	1

4,223,154
PREPARATION OF 2-(3-ARYL-5-ISOXAZOL) BENZOYL HALIDE

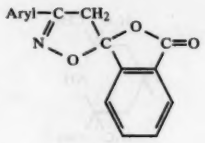
Kou-Chang Liu, Creve Coeur, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1979, Ser. No. 19,049
Int. Cl.[2] C07D *261/08;* A01N *9/22*
U.S. Cl. 548—248 7 Claims

1. A process for preparing 2-(3-Aryl-5-isoxazol) benzoyl halide having the formula



wherein X is a halogen which comprises treating 3'-(Aryl)-spiro[isobenzofuran-1(3H),5'(4'H)-isoxazol]-3-one having the formula



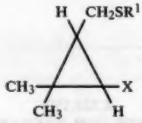
with a reactive halide and water.

4,223,155
3-(HYDROCARBYLTHIOMETHYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLATE PESTICIDES AND THEIR PREPARATION

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 18,479, Mar. 8, 1979. This application Jul. 26, 1979, Ser. No. 61,141
Int. Cl.[2] C07C *149/40, 149/26;* A01N *9/12*
U.S. Cl. 560—15 9 Claims

1. A compound of the formula



wherein R^1 represents an alkyl group containing from 1 to 10 carbon atoms optionally substituted by one or more halogen atoms; a (cycloalkyl) alkyl group containing from 3 to 7 ring carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms; a cycloalkyl group containing from 4 to 7 ring carbon atoms; an alkenyl group containing from 3 to 4 carbon atoms optionally substituted by one or more halogen atoms or alkynyl group containing from 3 to 4 carbon atoms or an aryl group containing from 6 to 12 carbon atoms or an aralkyl group containing from 7 to 10 carbon atoms, each optionally ring-substituted by one or more halogen atoms; X is —C(O)OR in which R represents a hydrogen atom, a salt-forming cation, or an alkyl group containing from 1 to 20 carbon atoms.

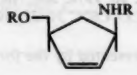
4,223,156

ADENOSINE DEAMINASE RESISTANT ANTIVIRAL PURINE NUCLEOSIDES AND METHOD OF PREPARATION

Robert Vince, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 766,947, Feb. 9, 1977, Pat. No. 4,138,562. This application Dec. 22, 1978, Ser. No. 972,469
Int. Cl.[2] C07C *79/46*
U.S. Cl. 560—20 1 Claim

1. A compound of the formula:



wherein R is selected from the class consisting of acetyl, benzoyl and p-nitrobenzoyl.

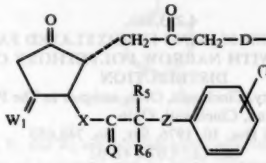
4,223,157

6-KETO-ωARYL-PGE$_1$ COMPOUNDS

Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 829,679, Sep. 2, 1977, which is a continuation-in-part of Ser. No. 755,675, Dec. 30, 1976, abandoned. This application Aug. 27, 1979, Ser. No. 70,228
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 47 Claims

1. A compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, α-H:β-H, methylene, or α-CH_2OH:β-H;
wherein R_3 is
(a) hydrogen
(b) alkyl of one to 12 carbon atoms, inclusive.
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2 or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,
(g) p-[p-(acetamido)benzamido]phenyl,
(h) p-(benzamido)phenyl,
(i) p-(acetamido)phenyl,
(j) —NH—CO—NH_2,
(k) CH=N—NH—CO—NH_2,
(l) β-naphthyl,
(m) —CH(R_{11})—CO—R_{10},
wherein Q is keto, α-H:β-H, α-OH:β-R_8, or α-R_8:β-OH, wherein R_8 is hydrogen, methyl or ethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_8 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_8 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph); wherein (Ph) is phenyl or phenyl substituted by (T)s,
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl on one to 4 carbon atoms, inclusive, and
wherein s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;
wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) —CH_2CH_2—
wherein D is
(1) —$(CH_2)_d$—$C(R_2)_2$—
(2) —CH_2—O—CH_2—Y— or
(3) —CH_2CH=CH— wherein d is zero to 5, R_2 is hydrogen, methyl or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—, and the pharmacologically acceptable salts thereof when R_3 is hydrogen.

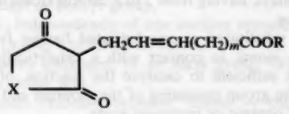
4,223,158

2,3,5-TRISUBSTITUTED CYCLOPENTANEALKENOIC ACIDS, DERIVATIVES THEREOF AND INTERMEDIATES THERETO

Mildred S. Bruhn, Niles, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 346,358, Mar. 30, 1973. This application May 4, 1979, Ser. No. 35,966
Int. Cl.[2] C07C *177/00, 61/38, 69/74*
U.S. Cl. 560—121 6 Claims

1. A compound of the formula



wherein X represents a carbonyl or hydroxymethylene radical, R is hydrogen or a lower alkyl radical and m is a positive integer greater than 2 and less than 5.

6. The compound which is methyl 7-(4-hydroxy-2-methoxy-5-oxocyclopent-1-ene)hept-5-cis-enoate.

4,223,159

BY-PRODUCT RECYCLING PROCESS

John A. Price, Kingston, N.J., and Edward F. Orwoll, Langhorne, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 26, 1979, Ser. No. 33,607
Int. Cl.[2] C07C *69/52*
U.S. Cl. 560—205 11 Claims

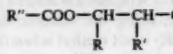
1. In a process for condensing 3-methyl-2-buten-1-ol and a lower alkyl orthoacetate to produce the desired lower alkyl 3,3-dimethyl-4-pentenoate ester, removing the desired ester by distillation, leaving a residue containing 3-methyl-2-butenyl 3,3-dimethyl-4-pentenoate, the improvement which comprises alkoxylating the residue with at least one alkoxylating agent selected from lower alkyl alcohols and orthoacetates in the presence of a basic ester exchange catalyst to yield as product the desired ester together with one or more of 3-methyl-2-buten-1-ol and a 1-(1,1-di(lower alkoxy)ethoxy)-3-methyl-2-butene and recycling the product as starting material in the process.

4,223,160
REACTION OF OXIRANE COMPOUNDS WITH CARBOXYLIC ACIDS

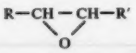
Lawrence G. Hess, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,018
Int. Cl.[2] C07C *69/02, 69/54, 69/74, 69/76*
U.S. Cl. 560—209 **11 Claims**

1. A process for the production of hydroxyalkyl esters of the formula



by the reaction of (I) an oxirane compound of the formula



with (II) a carboxylic acid of the formula

R''COOH

wherein R and R' individually are:
(a) hydrogen; or
(b) alkyl, linear or branched, saturated or unsaturated, substituted or unsubstituted, having from 1 to 8 carbon atoms; or
(c) aryl, substituted or unsubstituted, having from 6 to 8 carbon atoms and R'' is:
(a) hydrogen; or
(b) alkyl, linear or branched, substituted or unsubstituted, saturated or unsaturated, having from 1 to 7 carbon atoms;
(c) cycloalkyl, having from 5 to 8 carbon atoms in the molecules; or
(d) aryl, substituted or unsubstituted having from 6 to 8 carbon atoms, in contact with a catalytically effective amount sufficient to catalyze the reaction, of a catalyst from the group consisting of the niobium and ruthenium salts of organic or inorganic acids.

4,223,161
PROCESS FOR PRODUCING UNSATURATED ALIPHATIC ACIDS

Wilfrid G. Shaw, Lyndhurst; Ernest C. Milberger, Solon, and Serge R. Dolhyj, Parma, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Division of Ser. No. 691,691, Jun. 1, 1976. This application Mar. 31, 1977, Ser. No. 783,137
Int. Cl.[2] C07C *51/32, 57/04*
U.S. Cl. 562—534 **7 Claims**

1. The process for the oxidation of acrolein or methacrolein to acrylic acid or methacrylic acid, respectively, in the vapor phase with molecular oxygen, optionally in the presence of steam, at a temperature in the range of about 200° to about 500° C. employing a catalyst having the empirical formula:

$$Mo_a V_b W_c La_d X_e O_f$$

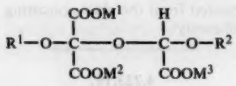
wherein X is one or more of the elements selected from the group consisting of manganese, iron, copper, zinc, aluminum, cobalt, nickel, cadmium bismuth, the alkali and the alkaline earth elements; and
wherein the number of atoms of each element present is represented by a through f
wherein
a is a number from 6 to 18;
b is a number from 0.1 to 10;
c is a number from 0.1 to 6;
d is a number from 0.01 to 5;
e is a number from 0 to 5; and
f is a number that satisfies the valence requirements of the other elements present.

4,223,162
ETHER CARBOXYLATES CONTAINING THREE CARBOXYLATE GROUPS

Marvin M. Crutchfield, Creve Coeur, Mo.; Kent P. Lannert, Freeburg, Ill., and Charles J. Upton, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 26, 1978, Ser. No. 945,972
Int. Cl.[2] C07C *59/22, 69/66*
U.S. Cl. 562—583 **9 Claims**

1. A compound represented by the formula:



wherein R^1 and R^2 are individually selected from the group consisting of alkyl containing up to about 20 carbon atoms, and M^1, M^2 and M^3 are individually selected from the group consisting of hydrogen, alkali metal, ammonium, alkanol amine containing up to about 4 carbon atoms, and alkyl containing up to about 4 carbon atoms.

4,223,163
PROCESS FOR MAKING ETHOXYLATED FATTY ALCOHOLS WITH NARROW POLYETHOXY CHAIN DISTRIBUTION

Haydee R. Guilloty, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 10, 1976, Ser. No. 749,653
Int. Cl.[3] C07C *41/02*
U.S. Cl. 568—618 **5 Claims**

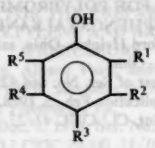
1. The process of preparing fatty alcohol polyethoxylates having a narrow distribution of polyethoxylate chain lengths in which a fatty alcohol containing from about 8 to about 18 carbon atoms is reacted with ethylene oxide in a ratio of ethylene oxide to fatty alcohol of from about 1 to about 20 at a temperature which is between room temperature and about 200° C. in the presence of an alkali metal or alkali metal hydride catalyst which is present in a molar ratio of catalyst to fatty alcohol of from about 0.9 to about 1.5 in which said ethylene oxide is added to the mixture of fatty alcohol and catalyst after the addition of the catalyst and before the formation of the fatty alcohol alkoxide is about 75% complete.

4,223,164
ETHOXYLATION WITH STRONTIUM BASES

Kang Yang; Gerald L. Nield, and Paul H. Washecheck, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jul. 2, 1979, Ser. No. 54,089
Int. Cl.[2] C07C *41/02*
U.S. Cl. 568—618 **11 Claims**

1. A method for the ethoxylation of alkanols comprising contacting said alkanols with ethylene oxide in the presence of a catalyst system comprising at least 1 material selected from the group consisting of strontium oxide, strontium hydroxide hydrated strontium hydroxide, together with an effective amount of a phenol or substituted phenol of the general formula



wherein R^1, R^2, R^3, R^4, and R^5 are, independently, hydrogen or an alkyl group containing from 1 to 16 carbon atoms and wherein the ethoxylation is carried out at a temperature of from about 90° to about 260° C.

4,223,165

PROCESS FOR THE HYDROXYLATION OF AROMATIC COMPOUNDS

Michel Jouffret, Francheville le Bas, France, assignor to Rhone-Poulenc Industries, Paris, France

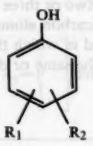
Continuation of Ser. No. 707,025, Jul. 20, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,352

Claims priority, application France, Jul. 25, 1975, 75 23313

Int. Cl.[2] C07C *37/00, 39/10*

U.S. Cl. 568—771 **15 Claims**

1. A process for the hydroxylation of aromatic compounds of the formula



in which R_1 and R_2 are independently selected from the group consisting of hydrogen and an alkyl containing from 1 to 3 carbon atoms which comprises reacting said compound with hydrogen peroxide at a reaction temperature between about −40° and 10° C., in a reaction medium comprising trifluoromethanesulfonic acid, wherein the volume ratio between the trifluoromethanesulfonic acid and the aromatic compounds is at least about 0.25, the molar ratio of hydrogen peroxide/aromatic compound is between about 0.025 and 0.3, and the weight of pure hydrogen peroxide relative to the weight of the trifluoromethanesulfonic acid is between about 1 and 30% whereby the para-hydroxylated isomer of said compound is formed as the predominant reaction product relative to all other hydroxylated isomers of said compound.

4,223,166

PROCESS FOR PRODUCING 4-BROMO-2-CHLOROPHENOLS

Roland Jaeger, Mulhouse, France, and Kurt Huber, Möhlin, Switzerland, assignors to Societe Anonyme pour l'Industrie Chimique, Mulhouse, France and Ciba-Geigy Corporation, Ardsley, N.Y.

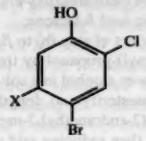
Continuation-in-part of Ser. No. 935,281, Aug. 21, 1978, abandoned. This application Feb. 23, 1979, Ser. No. 14,515

Claims priority, application Switzerland, Aug. 26, 1977, 010454

Int. Cl.[2] C07C *39/24*

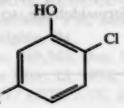
U.S. Cl. 568—779 **9 Claims**

1. A process for producing 4-bromo-2-chlorophenols of formula I



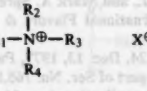
(I)

wherein X represents hydrogen or chlorine by bromination of a 2-chlorophenol of formula II



(II)

wherein X has the meaning given above, which process comprises brominating a 2-chlorophenol of formula II at a temperature of from about 0°–60° C. and with from about stoichiometric amounts up to an excess of 0.02 mole of bromine per mole of said 2-chlorophenol in the presence of from about 1–10%, by weight of said 2-chlorophenol, of a compound of the formula III



(III)

in which

R_1 represents an alkyl group having 1 to 8 carbon atoms, or the phenyl or benzyl group,

R_2 and R_3 independently of one another represent an alkyl group having 1 to 8 carbon atoms,

R_4 represents hydrogen, or an alkyl group having 1 to 8 carbon atoms, and

X represents chlorine, bromine, iodine, or the hydrogen sulfate anion.

4,223,167

PROCESSES FOR PREPARING β-SANTALOL, β-SANTALENE DIHYDRO-β-SANTALOL AND RELATED COMPOUNDS

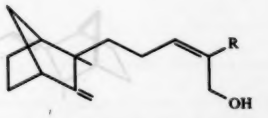
Brian J. Willis, Bergenfield; Philip A. Christenson, Midland Park, both of N.J., and Derek H. R. Barton, Gif-sur-Yvette, France, assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Feb. 14, 1978, Ser. No. 877,759

Int. Cl.[2] C07C *33/05, 31/13, 33/02*

U.S. Cl. 568—820 **10 Claims**

1. A process for preparing a compound having the structure



wherein R may be hydrogen or lower alkyl which comprises:

(a) preparing β-(2-exo-hydroxy-3,3-dimethyl-2-norbornyl)-propionic acid γ-lactone and its endo isomer from camphene by oxidizing camphene to form camphene epoxide and then reacting camphene epoxide with an anion which includes a group which allows formation of a lactone or imino-lactone type bridge;

(b) treating the product of step (a) with an acid to effect rearrangement to β-(3-exo-hydroxy-endo-2,3-dimethyl-2-norbornyl)-propionic acid δ-lactone;

(c) converting the product of step (b) to β-(2-endomethyl-3-methylene-2-norbornyl)-propanol by treating the product of step (b) with a lower alcohol in a solvent containing an acid catalyst to transesterify and dehydrate said product to lower alkyl-β-(2-endomethyl-3-methylene-2-norbornyl)-propionate and then reducing said propionate to said propanal by contacting said propionate with metal hydride; and

(d) reacting the product of step (c) with an alkylidene trisubstituted phosphorane and then treating the resulting product with base, then formaldehyde, so as to produce said compound.

4,223,168

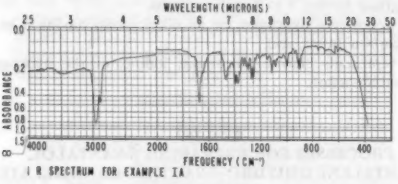
METHOD FOR PREPARING OXYHYDROCARBYLNORBORNANE DERIVATIVES

Kenneth K. Light, Highlands; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 860,124, Dec. 13, 1977, Pat. No. 4,186,150, which is a continuation-in-part of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Apr. 24, 1979, Ser. No. 32,851

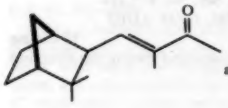
Int. Cl.³ C07C *35/21*

U.S. Cl. 568—345 **3 Claims**

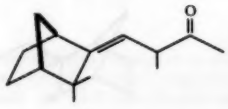


I R SPECTRUM FOR EXAMPLE IA

1. A process for preparing a mixture of compounds having the structures:



and



comprising the steps of reacting methyl ethyl ketone with camphene aldehyde in the presence of anhydrous hydrogen chloride whereby the anhydrous hydrogen chloride is continuously and intimately admixed with a mixture of methyl ethyl ketone and camphene aldehyde, said reaction being carried out at from 1 up to 5 atmospheres pressure and from ambient temperature up to 50° C.

4,223,169

PROCESS FOR POLYBROMINATING BISPHENOXYALKANES

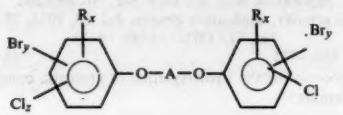
Henry J. Barda, Bedford Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 664,628, Mar. 8, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,765

Int. Cl.³ C07C *41/22*

U.S. Cl. 568—645 **34 Claims**

1. A process for polybrominating a bis(phenoxy) alkane that has two or three carbon atoms in its alkane moiety, to substitute at least three bromines on each of the aromatic rings of said bis(phenoxy) alkane, without substantial cleavage of either phenoxy-to-alkylene linkage, comprising reacting at a temperature of about minus 10° C. to about 150° C. the bisphenoxyalkane with an amount of bromine chloride that is in stoichiometric excess of that required for substantially complete bromination, in the presence of a catalytic amount of a metal halide Lewis acid catalyst of at least 5% by weight based on the bis(phenoxy) alkane, and a chemically inert organic solvent adapted to dissolve all of said reactants and catalyst, under substantially anhydrous conditions, to form a product having the formula:



in which A is alkylene of two or three carbon atoms; R is alkyl up to and including four carbon atoms; x is 0, 1 or 2; y is 3, 4 or 5; and z is 0, 1 or 2 and in which the R, x, y, and z for the respective rings may be the same or different.

4,223,170

HALOGENATED BISPHENOL-Z AND DERIVATIVES THEREOF

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 882,241, Feb. 28, 1978. This application Jun. 18, 1979, Ser. No. 49,630

Int. Cl.² C07C *39/17, 39/30, 39/34*

U.S. Cl. 568—721 **3 Claims**

1. 6,6'-Dichloro-4,4'-cyclohexylidenedi-o-cresol.

4,223,171

SUBSTITUTED DICHLOROVINYLIDENE (DIPHENOLS)

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 882,126, Feb. 28, 1978. This application Jun. 18, 1979, Ser. No. 49,629

Int. Cl.² C07C *39/17, 39/30, 39/34*

U.S. Cl. 568—726 **3 Claims**

2. A composition consisting of a statistical mixture of 4,4'-(dichlorovinylidene)diphenol, 2-chloro-4,4'-(dichlorovinylidene)diphenol, and 2,2'-dichloro-4,4'-(dichlorovinylidene)-diphenol.

4,223,172

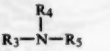
PROCESS FOR THE PREPARATION OF BROMOARYLACETYLENE AND ARYLDIACETYLENE PRECURSORS

Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 7, 1978, Ser. No. 967,244
Int. Cl.[2] C07C *29/00, 33/10, 33/04*
U.S. Cl. 568—812 **7 Claims**

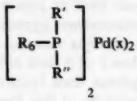
1. A process for the production of a bromoaryl hydroxy substituted acetylene selected from the group consisting of 2-methyl-4-(3-bromopheny!)-3-butyn-2-ol and 2-methyl-4-(4-bromophenyl)-3-butyn-2-ol which comprises:

reacting an aryldibromide selected from the group consisting of m-dibromobenzene and p-dibromobenzene with 2-methyl-3-butyn-2-ol, wherein the molar ratio of said 2-methyl-3-butyn-2-ol to said aryldibromide is in the range of 0.4:1 to 1.5:1, in the presence of a solvent comprising a compound having the formula:



where R_3, R_4 and R_5 can be the same or different and are selected from the group consisting of hydrogen and lower alkyl groups having from 1 to 4 carbon atoms with the proviso that no more than one of said R groups can be hydrogen, and in the added presence of:

a catalyst comprising a compound having the formula:



where x can be Br, I, or Cl;

and where R_6, R′ and R″ can be the same or different and are selected from the group consisting of phenyl, substituted phenyl and alkyl groups having from 1 to 4 carbon atoms; and a promoter comprising cuprous iodide;

at a temperature of 20° to 200° C. and atmospheric pressure to 250 psig for one to 150 hours; to produce HBr and a bromoarylhydroxy substituted acetylene selected from the group consisting of 2-methyl-4-(3-bromophenyl)-3-butyn-2-ol and 2-methyl-4-(4-bromophenyl)-3-butyn-2-ol.

4,223,173

BORANE REDUCING RESINS

Larry Manziek, Horsham, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 749,560, Dec. 10, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,939
Int. Cl.[2] C07C *5/00, 29/00, 29/14*
U.S. Cl. 568—835 **9 Claims**

1. In a process for the reduction of aldehydes, ketones and olefins the improvement which comprises contacting an aldehyde, ketone or olefin with a nonionic borane reducing resin which comprises a solid, cross-linked copolymer containing a plurality of amine- or phosphine-borane adducts.

2. A process according to claim 1 wherein the amine- or phosphine-borane adduct is of the formula

wherein

R^1 and R^2 are independently

(a) hydrogen;

(b) (C_1–C_8) optionally substituted alkyl;

(c) (C_6–C_{12}) optionally substituted aryl; and

(d) (C_7–C_{12}) optionally substituted aralkyl; and

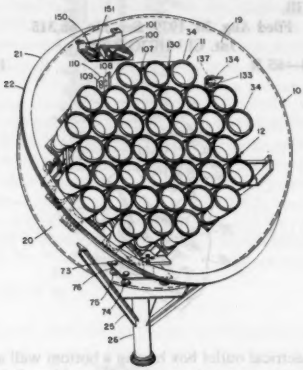
Z is nitrogen or phosphorous.

4,223,174

SUN-TRACKING SOLAR ENERGY CONVERSION SYSTEM

Douglas E. Moeller, Lincolnshire, Ill., assignor to Sun Trac Corporation, Glenview, Ill.

Filed Jul. 19, 1976, Ser. No. 706,748
Int. Cl.[2] H01L *31/04;* G01J *1/20;* G02B *5/10*
U.S. Cl. 136—246 9 Claims



1. Apparatus comprising a frame; a plurality of solar energy converter means mounted on said frame to form a solar panel for converting solar energy to another form of energy each of said solar energy converter means including a photovoltaic cell, heat exchanger means in heat transfer communication with said cell, and an energy concentrator having a collection window and an outlet aperture adjacent said cell, said concentrator having a gain of at least 6 to 1 and an interior reflective surface; a biangular conical shell having a first frustoconical wall extending from said cell to an intermediate location and defining a first angle relative to the boresight of said concentrator and a second frustoconical wall extending from said intermediate position to said collection window and defining a second angle relative to said boresight, said second angle being smaller than said first angle; support means for mounting said frame and said solar panel for independent motion about first and second axes; drive means for independently positioning said frame and said solar panel relative to said support means about said axes; control circuit means including sun sensor means for energizing said drive means to position said solar panel to face the sun; housing means of a material permitting transmission of solar energy substantially throughout its entire surface area and enclosing said solar panel, support means and drive means; and base means attached to said housing for rigidly supporting the same, whereby incident wind forces are transmitted from said housing directly to said base and not to said panel and support means.

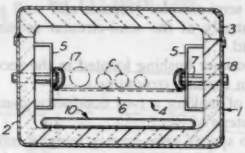
6. In combination with a solar panel comprising a plurality of solar cell conversion means rigidly secured together, and reversible drive means for rotating said panel about a predetermined axis; sun tracking circuit means comprising: reference sensor means responsive to solar energy for generating a reference signal in response to incident solar energy; opaque wall means extending in a plane parallel to said axis; first and second detecting sensor means, one on each side of said wall means for generating respectively second and third signals representative of incident solar radiation; first circuit means responsive to said reference signal and said second signal for energizing said drive means in one direction to rotate said panel about said axis toward the sun when the sun in on one side of said wall means; and second circuit means responsive to said reference signal and said third signal for energizing said drive means in a second direction to rotate said panel about said axis toward the sun when the sun is on the other side of said wall means.

4,223,175

CABLE SUPPORT SYSTEMS

Eric W. Crew, Broxbourne; Peter Harvey, London, and Andrew R. Fry, Barnet, all of England, assignors to BICC Limited, London, England

Filed Nov. 15, 1978, Ser. No. 960,866
Claims priority, application United Kingdom, Nov. 17, 1977, 47986/77; Oct. 18, 1978, 40946/78
Int. Cl.[2] H01B *7/34*
U.S. Cl. 174—15 R 28 Claims



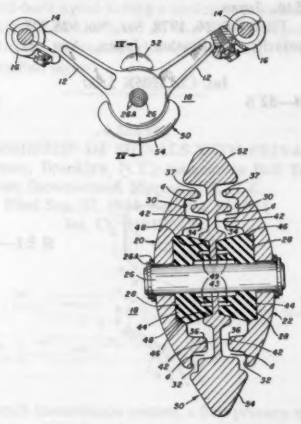
1. A support system for electric cables comprising means for supporting at least one electric cable; an elongate metal duct housing said support means and divided transversely of its length into separately formed parts that are detachably secured together; and lining the internal surface of at least a part of the length of the elongate duct, a continuous wall comprising at least one closed envelope containing non-flammable evaporative cooling fluid.

4,223,176

DAMPING SPACER WITH HUB INTERLOCK AND METHOD OF MAKING

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 17, 1979, Ser. No. 39,879
Int. Cl.[2] H02G *7/14, 7/12*
U.S. Cl. 174—42 8 Claims



1. A damping spacer for parallel overhead conductors comprising:

at least two rigid spacing members, each having a clamping means for securing the spacing members to respective overhead conductors, and a hub structure integral with each spacing member, with a rigid pin means extending perpendicularly through the hub structures mechanically connecting the spacing members together;

opposed, radially offset, semi-circular wall portions provided on at least one face of each integral hub structure,

with radially offset semi-circular recesses being formed by the wall portions;

the hub structures of the spacing members being placed together such that the wall portions of one hub structure extend into the recesses of the other hub structure, and vice versa, and the wall portions of both hub structures being located at the same radial distance from the center of the hub structures, and the dimensions of the wall portions and recesses being such that relative movement of the spacing members is permitted in all directions about the pin means;

a second recess provided in the faces of the hub structures having the semi-circular recesses and wall portions, and located centrally of the semi-circular recesses and wall portions, and

a resilient elastomer bushing located in the second recesses and between the hub structures.

8. A method of making a two conductor damping spacer comprising the steps of

providing two spacer arms having integral hub structures, with one face of each hub structure having opposed, radially offset, semi-circular wall portions which provide radially offset, semi-circular recesses,

providing a disc type structure having opposed faces provided with wall portions and recesses corresponding to those of the hub structures,

providing elastomer bushings for respective disposal between the faces of the hub and disc type structures,

disposing the elastomer bushings between the faces of the hub and disc type structures,

disposing the faces of the hub and disc type structures together on the elastomer bushings in a manner that locates the wall portions of the hub structure in the recesses of the disc type structure and vice versa, and

securing the structures and bushings together.

4,223,177

STRUCTURE AND METHOD FOR SEALING ELECTRONIC PARTS

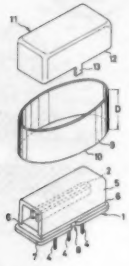
Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 26, 1978, Ser. No. 928,278

Claims priority, application Japan, Aug. 11, 1977, 52-107945[U]

Int. Cl.[2] H05K *5/00*

U.S. Cl. 174—52 S **10 Claims**



1. A sealed housing for an electronic component, comprising:

a base having a recessed shoulder around at least part of its perimeter;

external connection terminals which extend from said base and which can be connected to an electronic component for electrically connecting an electronic component to an external circuit;

an inner casing set on said recessed shoulder of said base;

a tube formed of a material that shrinks upon being heated, disposed at and snugly covering the junction between said base and said inner casing, said tube having been shrunk to fit tightly over said base and said inner casing; and

an outer casing fitting tightly over the combination of said inner casing, said base and said tube.

4,223,178

LOCKING MEMBER FOR OUTLET BOX CABLE

John L. Lass, Homewood, Ill., assignor to Square D Company, Palatine, Ill.

Filed Aug. 20, 1979, Ser. No. 68,315

Int. Cl.[2] H02G *3/08*

U.S. Cl. 174—65 R **11 Claims**

1. In an electrical outlet box having a bottom wall and sidewalls defining a receptacle space with a sidewall having a knock-out hole for receiving an electrical cable and securing means for retaining said cable, said securing means including a first member having a recess generally aligned with said hole and having a serrated surface at the base of said recess, said first member having a locking element extending from a surface therof and one wall of said box having an aperture receiving said locking element to secure said first member to said box, said one wall having a plurality of additional openings surrounding said aperture, a second member having a base portion and a plurality of legs extending from said base portion and equal in number to said additional openings, said second member cooperating with said first member to define a cable receiving opening aligned with said knock-out hole, each of said legs having a first camming ledge defining a space between said members for freely receiving said cable and a second camming ledge for locking said cable between said serrated surface and said base portion.

4,223,179

CABLE TERMINATION CONNECTOR ASSEMBLY

George E. Lusk, and Stephen D. Northrup, both of Woodstock, Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Jan. 5, 1978, Ser. No. 867,094

Int. Cl.[2] H02G *15/02*; H01R *7/12*

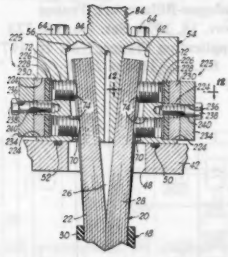
U.S. Cl. 174—73 R **32 Claims**

29. A connector assembly for a high voltage cable termination comprising

means for receiving, electrically connecting and securely retaining the bared end of a current carrying center conductor of an insulated high voltage power cable upon termination of the power cable, the center conductor of the power cable to be terminated having a plurality of wire strands, said receiving, electrically connecting and retaining means including a unitary conductive member having a plurality of elongated apertures formed therein, each aperture adapted to receive a desired portion of the plurality of wire strands, the desired portion comprising more than one wire strand, the longitudinal axes of a predetermined number of said plurality of apertures each forming an acute angle with respect to the longitudinal axis of the current carrying center conductor, and

means for physically supporting said receiving, electrically connecting and retaining means in said cable termination, said supporting means comprising an annular metallic

plate and fastening means for securing said metallic plate in said cable termination, said metallic plate including an



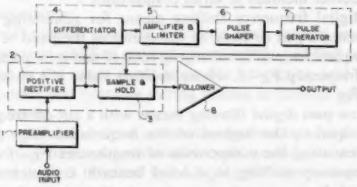
annular recess formed therein and said conductive member having a larger cross-section than said annular recess.

4,223,180

HUMAN SPEECH ENVELOPE TRACKER

Thomas L. Eckels, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1978, Ser. No. 972,200
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **3 Claims**



1. A method of accurate human speech envelope recovery comprising:

amplifying an audio signal of said human speech,

rectifying said amplified audio signal to derive a series of peak values of said audio signal,

differentiating said rectified audio signal to obtain slope information about each of said peak values, and

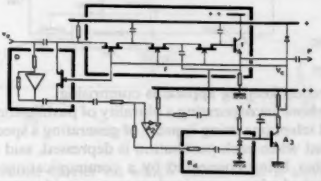
sampling and holding the rectified audio signal for an interval determined by said differentiated signal.

4,223,181

METHOD AND APPARATUS FOR PROCESSING SIGNALS

Bernard J. Simeau, 9, rue des Cites - Chadrac, 43000 LePuy, France

Filed Aug. 2, 1978, Ser. No. 930,250
Claims priority, application France, Aug. 9, 1977, 77 24494
Int. Cl.² H04R *3/00*
U.S. Cl. 179—1 D **23 Claims**



20. Apparatus for processing signals comprising

means for adjusting the level of one or more signals respectively applied to one or more processing channels,

filter means for splitting, on each processing channel, the applied signal or signals into two parts of adjacent spectra on opposite sides of a separation frequency, said filter means being provided with a control for the adjustment of the separation frequency and of at least one output of a filtered signal channel,

means for developing at least one feed-back signal by comparison with a signal representative of the level of the filtered signal to a reference value to react after amplification and integration on the level adjustment means of the corresponding processing channel,

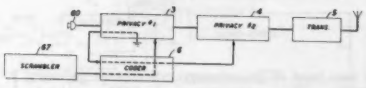
the said feed-back signal having a tendency to lock the signal representative of the level of the filtered signal in the vicinity of the reference value by adjustment of the level of the applied signal.

4,223,182

TRANSMISSION OF SIGNALS WITH PRIVACY

John M. Fraser, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 27, 1944, Ser. No. 556,031
Int. Cl.³ H04K *1/00*
U.S. Cl. 179—1.5 R **7 Claims**



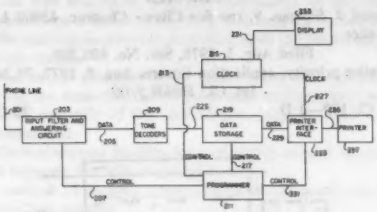
1. In a speech transmission system, a first privacy apparatus for making reversible alterations in speech message waves for rendering unauthorized reception of the message difficult, a second privacy apparatus for making a different kind of reversible alterations in the speech message waves for increasing the difficulty of unauthorized reception of the message, a common coding mechanism for controlling the alterations made in both privacy apparatuses, said coder supplying control potentials to the first of said privacy apparatuses, and means in said first privacy apparatus for translating said control potentials into control potentials of different character for controlling said second privacy apparatus.

4,223,183

TELEPHONE CONTROLLED ORDER ENTRY SYSTEM

Charles O. Peters, Jr., Rte. #2, Box 3595, Porter, Tex. 77365

Filed Dec. 4, 1978, Ser. No. 966,035
Int. Cl.[2] H04M 11/06
U.S. Cl. 179—2 DP 10 Claims



1. A recordkeeping apparatus comprising:

a telephone incorporating a plurality of pushbutton controls, said telephone being capable of generating a specific audio signal when each pushbutton is depressed, said telephone further being connected by a communications line to a switched telecommunications system, said system controlling a plurality of communications lines,

receiver means located at a situs remote from said telephone, connected to at least one said communication line and responsive to a sequential plurality of said audio signals for receiving and analyzing said plurality of audio signals to produce an output including internal data signals;

control means responsive to the output of said receiver means for separating said internal data signals into internal character data signals and internal function data signals, storing a plurality of said internal character data signals, and capable of eliminating said stored internal character data signals in response to one or more of said internal function data signals;

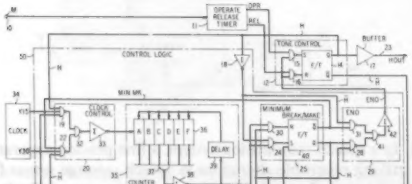
printer means for printing said stored internal character data signals as numbers and interface means for transmitting said internal character data signals to said printer means in response to one or more of said internal function data signals.

4,223,184

MINIMUM BREAK/MAKE PULSE CORRECTOR

John L. Gilmer, Falls Church, Va., and Joseph F. Rizzo, Lodi, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 24, 1978, Ser. No. 954,180
Int. Cl.[2] H04Q 1/36
U.S. Cl. 179—16 EA 9 Claims



1. A pulse corrector circuit (FIG. 1) of the type responsive to an input pulse signal (supplied via 10) for generating an output pulse signal (waveform H, FIG. 2, at 23) having a first output state for a duration of at least a first minimum interval (waveform H, FIG. 2) and a second output state for a duration of at least a second minimum interval (waveform H, FIG. 2), CHARACTERIZED BY,

output control means (12, or 11 and 12) jointly responsive to an input signal (supplied via 10) and a control signal (ENO) for generating a first output signal (H) having a first predetermined state for a duration of at least the first minimum interval (minimum break interval FIG. 2) and a second output state for a duration of at least the second minimum interval (minimum make interval FIG. 2), and

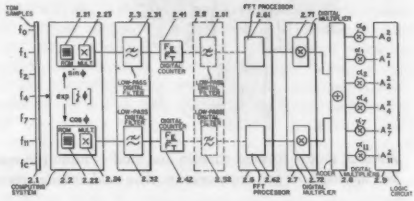
control logic means (50) responsive to said first output signal (H) and being supplied (from 34) with a first timing signal (Y15) having a first frequency determined in relationship with the first minimum interval (minimum break interval FIG. 2) and a second timing signal (Y30) having a second frequency determined in relationship with the second minimum interval (minimum make interval FIG. 2) for generating said control signal (ENO), wherein said control signal (ENO) controllably inhibits said output control means (12) (via 15 and 16) from responding to changes in state in said input signal during said first and second minimum intervals.

4,223,185

MULTIFREQUENCY DIGITAL SIGNAL RECEIVER

Claude H. Picou, Saint Cloud, France, assignor to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Nov. 14, 1978, Ser. No. 960,723
Claims priority, application France, Nov. 18, 1977, 77 34683
Int. Cl.[2] H04M 1/50
U.S. Cl. 179—84 VF 10 Claims



1. A digital receiver for multifrequency signals, each multifrequency signal comprising the sum of several sinusoids which are sampled at a frequency F_E, then quantified and linearly encoded, each sinusoid having the form $A_f \sin 2\pi ft$, whose frequencies f define a code and are selected out of q predetermined frequencies constituting an arithmetical series based on $\Delta F_f = p\Delta F_O$ (p being an integer, ΔF_O being a divisor of F_E, said receiver including means for calculating the fast Fourier transform (FFT) of an input signal, characterized in that said receiver includes in series connection:

(a) digital frequency shifting means for generating a frequency F_L at or close to the center of the band of said q frequencies, and for changing each of said q frequencies to a frequency $F_L - f$, whose absolute value is a multiple of ΔF_O;

(b) low-pass digital filtering means with a cut-off frequency f_p equal to the highest of the frequencies $|F_L - f|$, for attenuating the components of frequencies $F_L + f$ due to frequency shifting to a level beneath a predetermined level A_{min};

(c) means, connected to the output of said filtering means, for counting up to r and for retaining one sample of the multifrequency signal out of every r samples taken, r being chosen equal to F_E/F_T, where F_T is a divisor of F_E greater than $2f_p$ and a multiple of ΔF_O,

said fast Fourier transform calculation means being connected to the output of said counting means and including $N_T = F_T/\Delta F_O$ inputs fed, each second, with F_T samples ob-

tained from said filtering and said counting means, and v outputs, each corresponding to one, and only one, frequency f of an input digital signal.

4,223,186

CIRCUIT ARRANGEMENT FOR LINE-SUPPLIED SUBSCRIBER STATIONS HAVING DIAL DEVICES

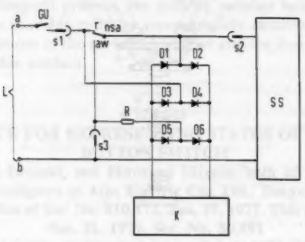
Karl D. Hartmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,023

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816311; Apr. 14, 1978, 2816347

Int. Cl.² H04M *19/00, 1/31*

U.S. Cl. 179—90 K **7 Claims**



1. A circuit arrangement for a subscriber station which is supplied with a current via a two-wire subscriber line and which includes a hookswitch serially connected to one of the line wires, a voice circuit having two leads and a dialing device having two leads, comprising:

a rectifier bridge circuit including a first bridge section comprising first and second bridge arms connected together at a first junction, a second bridge section comprising third and fourth bridge arms connected together at a second junction, and a third bridge section comprising fifth and sixth bridge arms connected together at a third junction, said first and second bridge arms together connected in parallel across said third and fourth bridge arms, across said fifth and sixth bridge arms, and across the leads of the dialing device;

an impedance;

dial off-normal contacts including first, second and third contacts, said first contact connected to said first junction and in the voice mode normally contacting said second contact and operable during dialing to contact said third contact;

first, second and third connection terminals, said first connection terminal connected to said second contact and to said second junction and adapted for connection to the hookswitch, said second connection terminal connected to said first junction with said first contact and adapted for connection to one lead of the voice circuit, and said third terminal connected to said third junction via said impedance and adapted for connection to the other line wire and the other voice circuit lead,

whereby in the voice mode said first and third bridge sections are rendered active and in the dialing mode said first and second bridge sections are rendered active.

4,223,187

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A VIDEO-DISC WITH AN OSCILLATED TRACK

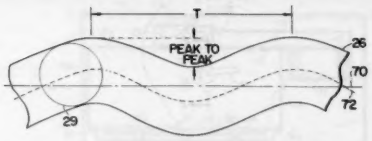
Seiji Yonezawa, Hachioji; Teruichi Tomura, Kunitachi; Akira Fukuhara, Tachikawa; Keizo Kato, and Masuo Umemoto, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 439,039, Feb. 4, 1974, abandoned. This application Apr. 8, 1977, Ser. No. 785,847

Claims priority, application Japan, Feb. 2, 1973, 48-12968

Int. Cl.² H04N *5/76*

U.S. Cl. 179—100.1 G **32 Claims**



32. A record carrier on which information is stored in an optically readable structure in the form of first areas alternating with second areas along tracks with lands between successive tracks, said first areas having a different effect on impinging radiation than the second areas and the lands between the tracks, the improvement wherein the tracks, viewed in a direction transverse to the direction in which the tracks are read, are provided with portions periodically displaced from the track center line axis alternately on opposite sides of the center line axis, the amount of displacement from the center line axis being smaller than the track width.

4,223,188

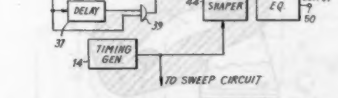
SCANNING SYSTEM FOR REPRODUCTION OF OPTICAL SOUND TRACKS WITH CLEAR AREA NOISE DISCRIMINATOR DELAY MEANS

Ray M. Dolby, San Francisco, Calif., assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 603,671, Aug. 11, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 778,870

Int. Cl.² G11B *7/00*

U.S. Cl. 179—100.3 A **5 Claims**



1. A scanning system for reproducing at least one variable area optical sound track, comprising scanning means arranged to scan repeatedly across the width of said at least one variable area sound track to provide a two-level first electrical signal, bistable circuitry for providing at least one second electrical signal, means responsive to said first signal for setting the bistable circuitry, thereby to set the second signal from a first level to a second level, by a transition in the first signal occurring as the scanning means scan from an opaque area to a clear area of said at least one variable area sound track, means for resetting the bistable circuitry, thereby to reset the second signal from the second level to the first level, at reference instants independently of the first signal, and delay means operative to delay setting of the bistable circuitry until a transition in the first signal occurring as the scanning means scan from an opaque area to a clear area of said at least one variable

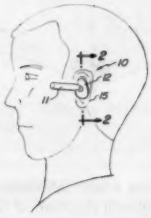
area sound track is followed by maintenance of the first signal at a level corresponding to a clear area of said at least one variable area sound track for a predetermined length of time established by the delay means.

4,223,189

SOUND DAMPENING EARPLUG MOUNTING DEVICE

James C. Warren, 3808 S. Jasmine, Denver, Colo. 80237

Filed Nov. 30, 1978, Ser. No. 965,092
Int. Cl.[2] H04R *1/10*
U.S. Cl. 179—182 R 5 Claims



1. An earplug mounting device for insertion into the human ear, wherein the human ear includes an outer ear and an auditory canal leading to the inner ear, comprising:

a resilient semi-rigid main body conformably fitting within the outer ear and extending into the auditory canal; and

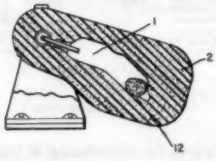
a boom rigidly affixed to said main body and extending away therefrom, said boom being made of a light weight plastic material of key shaped configuration having an enlarged rounded end and a generally rectangular portion extending away from said enlarged rounded end, said enlarged rounded end having a relatively narrow thickness as compared to the generally rectangular portion of said boom, and a curved ridge on either side of said boom separating said rounded end from said generally rectangular portion, said ridge extending above said generally rectangular portion.

4,223,190

MERCURY FLOAT SWITCH

Delwyn L. Olson, 3915 Bamboo Ter., Bradenton, Fla. 33505

Filed Dec. 1, 1977, Ser. No. 856,281
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 R 9 Claims



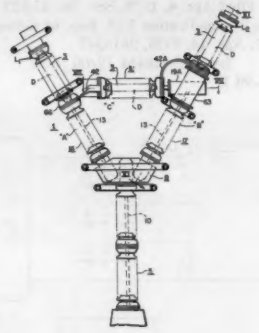
1. A mercury float switch comprising a float body formed of light, corrosion, resisting foam material, a mounting bracket disposed in supporting engagement relative to said float body, a mercury tube having a globule of mercury contained therein, said mercury tube potted on the interior of said foam material, a pair of switch contacts mounted on the interior of said mercury tube, a hollow shaft attached to said float body and so disposed to have its opposite ends extend outwardly therefrom, said hollow shaft having a slot formed therein intermediate its opposite ends, said slot disposed in communicating relation with said switch contacts, lead electrical wires, one each extending through each end of said hollow shaft and connected to said electrical contacts through said slot, said hollow shaft pivotally mounted on said mouting bracket and fixedly connected in supporting relation to said float body, said hollow shaft and said float body rotatable about the longitudinal axis of said hollow shaft, said globule of mercury disposed to bridge said contacts and electrically interconnect said lead electrical wires upon predetermined pivotal movement of said float body.

4,223,191

UPSTANDING MOUNTING STRUCTURE FOR HIGH-VOLTAGE THREE-BREAK LIVE-MODULE CIRCUIT-BREAKER

Ben J. Calvino, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,846
Int. Cl.[2] H01H *33/14, 33/82*
U.S. Cl. 200—145 4 Claims



1. A high-voltage three-break circuit-interrupting assemblage comprising a single, solitary, upstanding hollow insulating first column (5), a mechanism housing (8) surmounting said first upstanding hollow column and structurally connected to a pair of angularly-extending, second hollow column structures (16, 17), a generally-horizontally-extending hollow column structure (19) extending horizontally and meeting said second column structures (16, 17) adjacent the mid-points thereof, an arc-extinguishing unit (3) disposed interiorly of each of the second and horizontally-extending hollow column structures and being electrically interconnected in series, and a second mechanism housing (63) disposed adjacent one end of the horizontally extending hollow column structure, mechanical means for opening and closing electric circuits through the serially connected arc-extinguishing units and including motion-conveying operating rods and linkage operatively connected to each unit, said linkage extending through the interconnected first column, mechanism housing, second hollow column structures, second mechanism housing, and horizontal-extending hollow column, whereby simultaneous operation of the three arc-extinguishing units (3) occurs in response to operation of mechanical means.

4,223,192

GAS BLAST CIRCUIT BREAKER

Karl Zuckler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

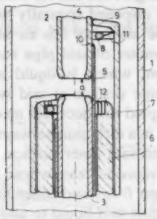
Filed Dec. 18, 1978, Ser. No. 970,215
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759268
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 R 4 Claims

1. A gas circuit breaker comprising two stationary nozzle-shaped contacts which are spaced apart to leave a gap,

a hollow cylindrical movable contact for bridging the gap

between the stationary contacts when in the "on" position,

a blasting device comprising a piston and a movable cylinder, the movable cylinder having a bottom surrounding a first of said stationary contacts and being coupled to the hollow movable contact for motion off of the first contact and past the gap during the switching-off process, and



an annular member of insulating material having a length which is shorter in the axial direction than the length of the gap for reducing the cross-section of the oncoming flow between the stationary contacts in the course of the switching-off process, the annular member being carried by the movable cylinder approximately centered between the bottom of the movable cylinder and the free end of the movable contact.

4,223,193

DEVICE FOR REPRESENTING STATUS OF PUSH BUTTON SWITCH

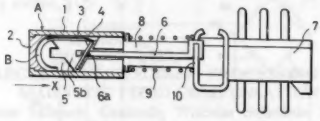
Sadayoshi Iwasaki, and Hiroyasu Miyata, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 810,173, Jun. 27, 1977. This application Jun. 21, 1979, Ser. No. 50,591

Claims priority, application Japan, Jul. 1, 1976, 51-86977

Int. Cl.[2] G09F *9/00*; H01H *9/16*

U.S. Cl. 200—308 **1 Claim**



1. A device for representing the status of a push button switch, comprising:

a hollow push button member having a transparent window at one end thereof;

an attaching member extending within the other end of said push button member and adapted to be attached to an operation rod of said switch;

an elongate representation member comprised of a resilient material and located slidably between an inner surface of said push button member and said attaching member, said representation member having an arm portion held pivotally on said attaching member;

a supporting rod adapted to be secured at its one end to a housing for said switch, the other end of said rod projecting into said push button member and having members formed thereon for holding pivotally a mid portion of said arm portion;

whereby, when said push button member is moved to a first position, said rod will pivot said arm portion and cause forward sliding movement of said representation member to position the forward end portion thereof adjacent said window, and when said push button is moved to a second position, said rod will pivot said arm portion and cause backward sliding movement of said representation member to retract the forward end portion thereof from said window.

4,223,194

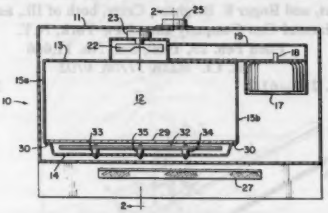
MICROWAVE OVEN WITH MEANS FOR MODIFYING ENERGY DISTRIBUTION THEREIN

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 26, 1978, Ser. No. 973,401

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 F **7 Claims**



1. In a microwave cooking oven having a microwave energy source, an interior cooking cavity including top, bottom and vertical side walls, and means including a feed aperture in the top wall for feeding the microwave energy from said source through the top wall into the cavity, an improvement for more evenly distributing microwave energy in the cavity comprising

a metallic, electrically conductive, relatively thin, flat, rectangular plate oriented parallel to the bottom wall and spaced therefrom a sufficient distance to support microwave energy excitation between the underside of the plate and the cavity bottom wall, the edges of said plate being spaced from the vertical side walls at least in the region of said cavity where the microwave energy level would be highest in the absence of the conductive plate.

4,223,195

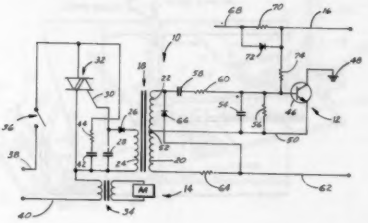
PULSE TRANSFORMER

Jon H. Bechtel, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 4, 1978, Ser. No. 931,201

Int. Cl.[2] H05B *9/06*; G05F *3/00*

U.S. Cl. 219—10.55 B **7 Claims**



1. A pulse transformer circuit for triggering a magnetron in a microwave oven from a low level d.c. signal comprising:

an a.c. transformer having secondary and primary windings wherein said secondary is coupled in a secondary circuit to trigger said magnetron when actuated,

a blocking oscillator circuit employing a single transistor connected with an output to said primary winding and having a biasing capacitor at its base and a discharging

feedback connection from said output of said transistor to said biasing capacitor;

a voltage supply connected to said primary winding and with a shunt connection to said biasing capacitor to charge said biasing capacitor; and

a low level d.c. control signal line connection to complete a charging circuit from said voltage supply and through said biasing capacitor.

4,223,196

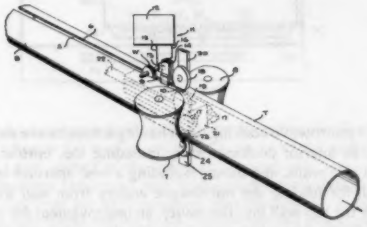
WELDED TUBULAR ARTICLES AND METHOD FOR MAKING THE SAME

Paul M. Erlandson, New Canaan, Conn.; Lee R. Ullery, Park Forest, and Roger S. Brigham, Crete, both of Ill., assignors to Continental Can Company Inc., New York, N.Y.

Filed Feb. 29, 1960, Ser. No. 11,666

Int. Cl.[2] B23K *31/06, 9/02*

U.S. Cl. 219—61.2 **26 Claims**



1. A welded joint between thin metal sheet portions, said joint including a diagonal weld interface, the welded area being devoid of weld nuggets, and only the edge portions of said metal sheet portions being visibly microstructurally heat affected, said sheet portions having a thickness ranging from 0.004 to 0.011 inch and the width of said heat affected area being approximately 0.150 inch.

4,223,197

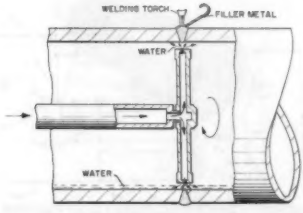
METHOD OF COOLING WELD IN STEEL PIPING AND APPARATUS THEREFOR

Katsuyuki Imai; Isao Masaoka; Yositeru Chiba, and Jiro Kuniya, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,403

Int. Cl.[2] B23K *31/06*

U.S. Cl. 219—61.7 **6 Claims**



1. A method for cooling a weld in a steel pipe during butt welding with cooling of the inside, which comprises, after joining of pipe ends by a root pass on the inside, cooling the junction being welded by subsequent passes by injecting a liquid medium which is liquid at 20°–30° C. against the inner pipe surface at the weld junction, in a direction between radial and tangential directions relative to said inner surface, said liquid medium being injected by positioning a nozzle assembly rotatably disposed coaxially within said pipe, which nozzle assembly has an outer diameter smaller than the inside diameter of said steel pipe, rotating said nozzle assembly, and injecting said liquid medium from said rotating nozzle assembly against the inner pipe surface at the weld junction, said nozzle assembly including three or more nozzles whose tips are spaced a distance of 5 to 20 mm from the inner surface of the steel pipe.

5. An apparatus for cooling a weld in a steel pipe during butt welding with cooling of the inside, which comprises a nozzle assembly rotatably disposed coaxially within a pipe at a weld zone, which nozzle assembly has an outer diameter smaller than the inside diameter of said pipe and which is capable of injecting a medium, which is liquid at room temperature, against the inner pipe surface at said weld zone, said nozzle assembly being adapted to inject said medium against the inner surface of said pipe in a direction between radial and tangential directions relative to said inner surface, said nozzle assembly including three or more nozzles whose tips are spaced a distance of 5 to 20 mm from said inner surface of said pipe, a ducting for conducting said liquid to said nozzle assembly, and a pumping device for forcing said liquid under pressure into said nozzle assembly.

4,223,198

ARM DEFLECTION CONSTANT TRAVELING-WIRE EDM METHOD AND APPARATUS

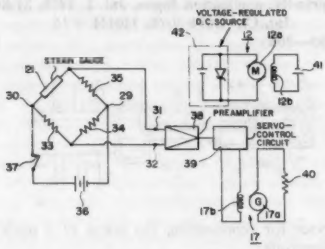
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 5, 1979, Ser. No. 1,290

Claims priority, application Japan, Jan. 11, 1978, 53-1085; Mar. 22, 1978, 53-31668

Int. Cl.[3] B23P *1/08*

U.S. Cl. 219—69 W **10 Claims**



1. A method of operating a traveling-wire electrical discharge machine including a continuous elongated electrode, a pair of arm members constituting an electrode-guiding arm system by being fixedly mounted individually on a common support and having at their respective free end portions guide sections spanned by said electrode for positioning it in a predetermined machining relationship with a workpiece, and means for advancing said elongated electrode from a supply reel to a take-up reel to axially transport and stretch said elongated electrode between said guide sections across a machining zone, said method comprising the steps of:

(a) sensing the deflection of at least one of said arm members and generating an electrical signal representing said deflection, and

(b) controlling said electrode-advancing means in response to said electrical signal so as to maintain said deflection of said electrode-guiding arm system substantially constant, thereby maintaining the positioning of the spanned elongate electrode in said predetermined machining relationship with the workpiece.

4,223,199

CHARGED PARTICLE BEAM WELDING WITH BEAM DEFLECTION AROUND WELD POOL RETAINERS

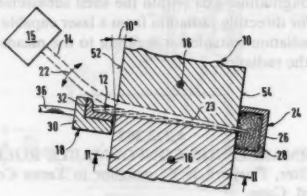
Karl-Heinz Steigerwald, Starnberg, and Wilhelm Scheffels, Puchheim, both of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik G.m.b.H., Munich, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,526

Claims priority, application United Kingdom, May 30, 1977, 22788/77

Int. Cl.[2] **B23K** *15/00, 9/08, 37/06;* **B22D** *27/02*

U.S. Cl. 219—121 EM **17 Claims**



1. Apparatus for welding a workpiece with a charged particle beam comprising means for directing a charged particle beam along a beam path onto a workpiece, means for moving said workpiece with respect to said beam path, means for retaining a pool of molten material in said workpiece adjacent said beam path, and beam deflection means operative to provide a curved beam path in the vicinity of at least one surface of said workpiece, said beam path being curved to avoid impingement on said retaining means.

14. In a method for welding a workpiece with a beam of charged particles moving along a beam path onto said workpiece, wherein said workpiece is moved with respect to said beam path, and wherein a pool of molten material is maintained in the workpiece adjacent said beam path by a retaining means, the improvement wherein said charged particle beam path is deflected into a curved beam path in the vicinity of at least one surface of said workpiece to avoid beam impingement on the retaining means.

4,223,200

CHARGED PARTICLE BEAM PROCESSING WITH MAGNETIC FIELD COMPENSATION

Clauspeter Möench, Grafrath; Wilhelm Scheffels, Puchheim; Dieter König, Munich, and Karl H. Steigerwald, Starnberg, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik G.m.b.H., Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,503

Claims priority, application United Kingdom, Jul. 6, 1977, 28358/77

Int. Cl.[2] **B23K** *15/00*

U.S. Cl. 219—121 EB **7 Claims**

1. In an apparatus having means for directing a high-energy beam of charged particles along a predetermined beam path onto a surface of a workpiece,

a device for compensating for spurious magnetic fields tending to cause an undesirable deviation of said beam from said beam path, said device comprising:

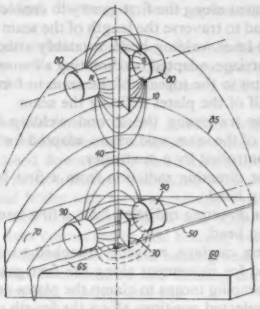
(a) first electromagnetic means having a first pair of pole pieces positioned mutually opposed and spaced along a first axis on opposite sides of said beam path adjacent said workpiece surface;

(b) first magnetic probe means positioned between one of said first pole pieces and said beam path to provide a first output signal depending on the strength of a first component of a spurious magnetic field, said component extending essentially along said first axis;

(c) first controllable current source means connected to said first electromagnetic means for supplying current thereto; said current source means being controllable by said first output signal to essentially compensate for said first magnetic field component;

(d) second electromagnetic means having a second pair of pole pieces positioned mutually opposed and spaced along a second axis on opposite sides of said beam path at a location which is spaced from said workpiece surface beyond said first axis, said second axis extending essentially parallel to said first axis;

(e) second magnetic field probe means positioned between



one of said second pole pieces and said beam path to provide a second output signal depending on the strength of a second component of the spurious magnetic field, said component extending essentially along said second axis; and

(f) second controllable current source means connected to said second electromagnetic means for supplying current thereto; said second current source means being controllable by said second output signal to essentially compensate for said second magnetic field component.

4,223,201

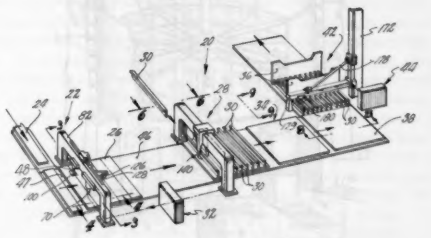
LASER WELDING APPARATUS FOR SHIPYARD PANEL SHOPS

George T. Peters, Farmington, Conn., and Kjell Lonning, Stord, Norway, assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,597

Int. Cl.[3] **B23K** *27/00*

U.S. Cl. 219—121 LC **11 Claims**



1. An automated panel welding station for the fabrication of panel subassemblies suitable for ship construction comprising:

a worktable adapted for aligning horizontally and pressing plates together for maintaining a seam therebetween suitable for laser welding;

a first carriage, positioned below the worktable, adapted for movement across the width of the worktable to enable a first welding head to traverse the length of the seam between a pair of adjacent plates;

a first welding head, rotatably attached to the first carriage,

adapted for directing a focused beam of laser radiation to the underside of the seam to form a weld in the bottom half of the plates defining the seam;

means for traversing the first welding head along the length of the seam, said means adapted for being activated and controlled by a controller;

a first gantry, positioned above the worktable, extending over the width of said worktable, adapted for supporting a second carriage;

a second carriage, attached to the first gantry, adapted for movement along the first gantry to enable a second welding head to traverse the length of the seam between plates;

a second laser welding head, rotatably attached to the second carriage, adapted for directing a focused beam of laser radiation to the topside of the seam to form a weld in the top half of the plates defining the seam;

means for traversing the second welding head along the length of the seam, said means adapted for being activated and controlled by a controller;

means for directing radiation from a first laser to the first welding head;

means for directing radiation from a first laser to the second welding head;

a clamping carriage, movably attached to the first gantry, adapted for movement along the first gantry to enable a first clamping means to clamp the plates onto the worktable at selected positions along the length of the seam;

first clamping means for releasably clamping adjacent plates, proximate the seam, against the worktable to maintain the alignment of the seam during tack welding; and

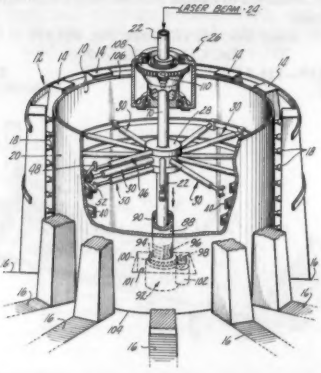
means for tracking the seam to provide position coordinates of the seam to a controller.

4,223,202

APPARATUS AND METHOD FOR WELDING BOAT SUBASSEMBLIES UTILIZING LASER RADIATION

George T. Peters, Farmington, and Conrad M. Banas, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,598
Int. Cl.[3] B23K *27/00*
U.S. Cl. 219—121 L **15 Claims**



1. An apparatus for fabricating reinforced hull sections suitable for boat construction comprising:

a support structure adapted for circumferentially enclosing a shell subassembly and radially pressing against an exterior surface of said subassembly for constraining motion of the shell subassembly in a radial direction;

interior ram means adapted for radially pressing T-frames disposed circumferentially about an interior surface of the shell subassembly at a preselected axial position against an interior surface of said subassembly forming a junction therebetween suitable for Tee welding and for maintaining the circumferential axial position of the T-frame during welding;

means for focussing radiation onto the junction for welding the T-frame to the shell subassembly;

means for rotating the means for focussing radiation about a longitudinal axis of the shell subassembly for circumferentially moving the radiation along the junction to circumferentially weld the T-frame to the shell subassembly;

means for axially positioning the interior ram means and the means for focussing radiation at selected positions along the longitudinal axis within the shell subassembly; and

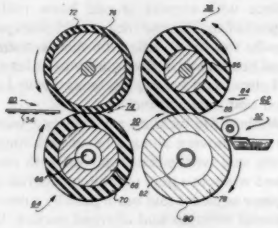
means for directing radiation from a laser capable of providing radiation suitable for welding to the means for focussing the radiation.

4,223,203

CONFORMABLE/NON-CONFORMABLE ROLL FUSER

John F. Elter, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 22, 1978, Ser. No. 944,945
Int. Cl.[3] H05B *1/00*; G03G *15/20*
U.S. Cl. 219—216 **5 Claims**



1. Roll fuser apparatus for fixing toner images to copy substrates utilizing first and second fusing systems through which the substrates pass in series with transport means for reeding the substrates to the first fuser, the improvement comprising: a conformable contact fusing system including a conformable roll which contacts said toner images, said conformable contact fusing system constituting one of said fusing systems and a non-conformable contact fusing system including a non-conformable roll which contacts said toner images and comprises the other of said fusing system.

4,223,204

MACHINE FOR MARKING BAKED GOODS

Melvin A. Benedict, 4185 Ivanhoe Dr., Monroeville, Pa. 15146

Filed Aug. 17, 1978, Ser. No. 934,467
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—243 **4 Claims**

1. A machine for marking a baked bun comprising:

an electric heating element;

a formed heat conducting pattern connected to said electrical heating element to be heated thereby;

a detachable head supporting said heating element and said formed pattern;

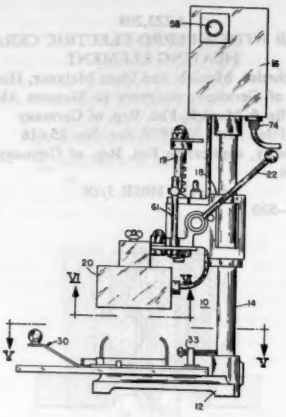
bun receiving means for holding a baked bun;

bun positioning means for moving said bun receiving means beneath said formed pattern;

a supporting arm having said head connected thereto and being movable between a position wherein said formed pattern contacts said bun and a position wherein said formed pattern is spaced apart from said bun;

supporting arm position adjusting means for adjusting the

depth of penetration of said pattern into said bun when said formed pattern moves into contact with said bun; and,



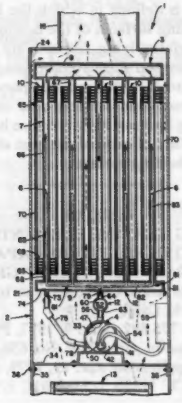
an adjustable timer which is activated when said formed pattern moves into contact with said bun.

4,223,205

CENTRAL HEATING SYSTEMS FURNACE HAVING A SELF-CONTAINED ELECTRIC STEAM HEATING UNIT

Clifford M. Sturgis, 1213 Westmoreland, Colorado Springs, Colo. 80907

Filed May 30, 1978, Ser. No. 910,735
Int. Cl.[2] H05B *1/00;* F24H *3/08;* F24D *13/04*
U.S. Cl. 219—365 **6 Claims**



6. A furnace for central heating system comprising:

(a) a housing;

(b) a closed-system steam heating unit mounted in said housing and including:

(1) a boiler unit containing a liquid to be vaporized therein;

(2) a heating element mounted in said boiler unit and operative to heat the liquid and form steam therein;

(3) a radiator unit positioned above said boiler unit and having a plurality of spaced apart, upright tubular risers, an upper manifold connecting upper ends of the risers and communicating therewith and a lower manifold connecting the lower ends of the risers and communicating therewith;

(4) a horizontal steam tube positioned between an upper portion of said boiler unit and a lower portion of said lower manifold and being communicatively connected with said boiler unit for receiving steam therefrom;

(5) a steam distributing manifold in said lower manifold, said steam distributing manifold having tubular discharge members extending upwardly into lower ends of certain of the risers and having connection with an upper portion of said steam tube for conducting steam therefrom and discharging same upwardly into said risers;

(6) an upright tubular condenser member having upper and lower ends communicating respectively with the upper and lower manifolds in spaced relation to said risers;

(7) a tubular condensate return member with one end portion thereof connected with the lower manifold and, being inclined downwardly therefrom, and having the other end portion thereof connected with a lower portion of said boiler unit for transmitting vapor condensate from said lower manifold to said boiler unit;

(c) a cold air duct connected to said housing and returning cold air from said system to said heating unit;

(d) a hot air duct connected to said housing and receiving warm air from said heating unit and

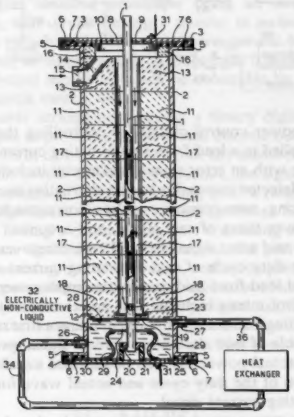
1 (e) blower means drawing air through said cold air duct and forcing the same around said heating unit to receive heat therefrom, and into said hot air duct.

4,223,206

METHOD AND APPARATUS FOR ELECTRICALLY HEATING CORROSIVE VAPORS

Anthony Horton, Welwyn Garden City; Thomas M. McKeon, Warrington, and Jack Preston, Sheffield, all of England, assignors to Laporte Industries Limited, London, England

Filed Jan. 25, 1978, Ser. No. 872,050
Claims priority, application United Kingdom, Jan. 26, 1977, 03176/77
Int. Cl.[2] F24H *3/04;* H05B *3/02*
U.S. Cl. 219—374 **23 Claims**



1. Apparatus for heating corrosive vapour, which comprises;

a casing;

a hollow, tubular, metal electrical resistance heating element in the casing, of which element at least one portion is fixed relative to the casing and at least one other portion is movable relative to the casing under the influence of thermal expansion and contraction;

inlet means for passing vapour to be heated into the casing and into contact with the element;

means within said housing defining a vapour flow conduit externally spaced from and surrounding the element and coaxial therewith;

outlet means for passing heated vapour from the casing; said inlet, the conduit, the interior of said heating element and said outlet being so arranged and interconnected as to cause the corrosive vapour to successively pass in opposite directions along the exterior and the interior of the element in flowing through said casing from said inlet to said outlet; and

electrical connection means on said casing and connected to the movable portion of the element for supplying electric power to said element, said electrical connection means comprising at least one flexible electrical coupling of sufficient flexibility to allow said element to move under the influence of thermal expansion and contraction, and liquid immersion means in said casing so arranged relative to said electrical connector means that at least a part of said at least one flexible coupling is maintained immersed in a body of an electrically non-conductive liquid capable of shielding said coupling from corrosive vapours during use of the apparatus.

4,223,207

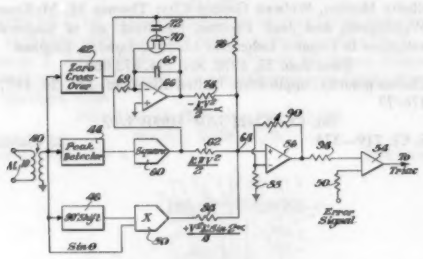
APPARATUS FOR CONTROLLING THE POWER SUPPLIED TO A LOAD

Allan T. Chow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1978, Ser. No. 880,945

Int. Cl.[2] **H05B** *1/00, 1/02*

U.S. Cl. 219—494 **4 Claims**



1. In a power control circuit for controlling the electrical power supplied to a load from an alternating current source in accordance with an error signal, said circuit including a zero-crossover detector responsive to said alternating current signal for producing zero-crossover pulses corresponding to the zero-crossover times of said signal, and a control means responsive to said error signal and said zero-crossover pulses for varying the duty cycle of said alternating current signal supplied to said load from said source, the improvement wherein

said control means includes first means responsive to said alternating current signal for generating a first signal, each half cycle of said alternating current signal, proportional to the actual power that can be supplied to said load as a function of the duty cycle and actual wave form of said alternating current signal,

switching means coupled between said load and said alternating current source, and

comparator means for comparing said first signal with said error signal to vary said duty cycle, said comparator means functioning to vary the firing angle of said switching means thereby to vary the power actually supplied to said load,

said first means also including evaluating means for continuously evaluating the time integral of the square of the voltage of each half cycle of said alternating current signal, thereby to provide said first signal.

4,223,208

HEATER WITH A FERRO-ELECTRIC CERAMIC HEATING ELEMENT

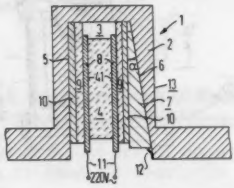
Peter Kleinschmidt, Munich, and Hans Meixner, Haar, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,616

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1978, 2816076

Int. Cl.[3] **H05B** *3/06*

U.S. Cl. 219—530 **17 Claims**



1. A heater comprising: a ferro-electric PTC thermistor ceramic plate-shaped heating element having two substantially flat heating surfaces lying substantially opposite one another and which are both in substantially equal heat-conducting connection with a member to be heated; means for feeding a current through the heating element which has at least one surface electrically insulated from the member to be heated; said member having spaced walls of heat conductive material joined by a third wall so as to provide at least a pair of flat heat absorption surfaces opposite one another between which an intermediate space is defined in which the heating element is positioned; the heating surfaces of the heating element and the heat absorption surfaces lying respectively opposite one another; and wedge-shaped means comprising heat-conductive material wedged into the intermediate space between at least one of the heat absorption surfaces and one of the heating surfaces for creating intimate high pressure heating connection between a total surface of each of the heat absorption surfaces and the respective heating surface.

4,223,209

ARTICLE HAVING HEATING ELEMENTS COMPRISING CONDUCTIVE POLYMERS CAPABLE OF DIMENSIONAL CHANGE

Stephen H. Diaz, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 775,882, Mar. 9, 1977, Pat. No. 4,177,446, which is a continuation-in-part of Ser. No. 638,440, Dec. 8, 1975, abandoned. This application Apr. 19, 1979, Ser. No. 31,468

Int. Cl.[2] **H05B** *3/38;* **H01C** *3/06*

U.S. Cl. 219—549 **12 Claims**

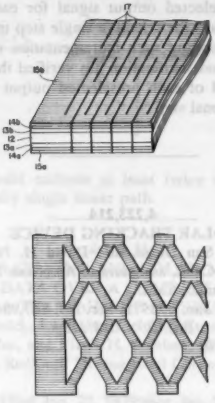
1. An article which comprises a heat-responsive sheet material and adjacent and secured to one face of the sheet material a heating element which comprises:

(A) a laminar member composed of a material which comprises an organic polymer and electrically conductive particles dispersed in the polymer in amount sufficient to render the member electrically conductive; and

(B) a pair of laminar flexible electrodes which (i) are connected to opposite faces of said laminar member; (ii) are substantially parallel to said laminar member; and (iii) are adapted to be connected to an external source of power to cause current to pass through said laminar member;

said laminar member and laminar electrodes having a plurality of apertures through the thickness thereof, the apertures being

of elongated closed cross-section and overlapping one another to permit at least one of the dimensions of the element in the



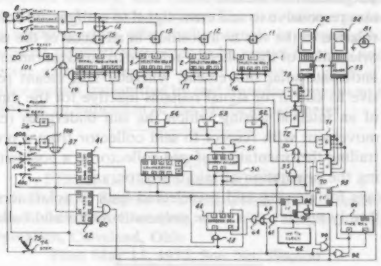
plane thereof to be changed by a change in the shape of the apertures.

4,223,210

ELECTRONIC VENDING MACHINE SELECTION COUNTER

Lee C. Verduin, Grand Rapids, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed Mar. 1, 1978, Ser. No. 882,358
Int. Cl.[2] G06M *3/06*
U.S. Cl. 235—92 AC **21 Claims**



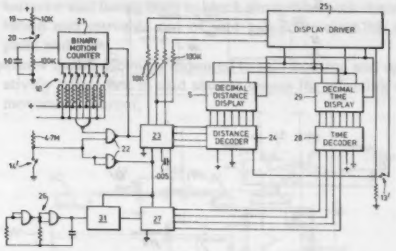
1. Apparatus including in combination manually actuable selection means for effecting a plurality of merchandising selections one at a time, a plurality of counting registers corresponding to said selections, each of said counting registers being adapted to store a count and having an identifying signal associated therewith, individual indexing means responsive to said selection means for incrementing the count of the register corresponding to the effected selection, means for interrogating said counting registers, and means responsive to said interrogating means for successively generating said identifying signals in such an order that the counts of the registers successively identified form a monotonic sequence.

4,223,211

PEDOMETER DEVICES

Philip E. Allsen, and Brent Q. Hafen, both of Provo, Utah, assignors to Vitalograph (Ireland) Limited, Ennis, Ireland

Filed Apr. 3, 1978, Ser. No. 892,772
Int. Cl.[2] G01C *22/00*
U.S. Cl. 235—92 DN **8 Claims**



1. A pedometer device for indicating distance traveled on foot by a human subject, which device comprises:

a battery powered electrical circuit having an output,

a motion-sensitive modulator responsive to motions accompanying foot motions of the subject during said traveling to modulate said output and thereby provide discrete output signals, the number of which is a count of the number of said motions,

means for providing a numerical value which is a function of the distance to be traveled by the subject for each one of said motions,

a counter arrangement responsive to said output signals and to said means for providing a numerical value to produce a distance sub-unit signal each time the number of discrete output signals provided by said modulator reaches a preselected value, and

means having a visual display arranged to be incremented by said distance sub-unit signals and indicate said distance travelled,

said motion sensitive modulator being an on-off inertia switch, said circuit having a resistor in series with said inertia switch, and said counter arrangement being sensitive only to output signals of magnitude comparable with such output signals as would be obtainable by by-passing said inertia switch, and

said counter arrangement having a binary digital counter arranged to provide a count of said discrete output signals in the form of a set of binary bits, the members of which set each have a different significance, the significances of the members of the set extending over a range from the least significant bit to the most significant bit, and said range having a commencing part containing a number of the least significant bits, and a remainder part containing the remaining bits of the range, and a comparator, operable to pass a distance sub-unit to said means having a visual display and to reset said binary digital counter to zero when the count represented by the bits of said remainder part coincides with the value at which said means for providing a numerical value is set.

4,223,212

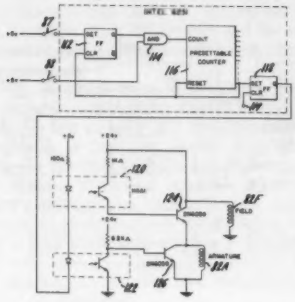
CARD SELECTOR DEVICE

David L. Smith, and John M. Jamieson, both of Atlanta, Ga., assignors to Computer Microfilm International Corporation, Atlanta, Ga.

Filed Apr. 10, 1978, Ser. No. 894,763
Int. Cl.[2] G06F *7/38*
U.S. Cl. 235—92 MP **2 Claims**

1. In a storage and retrieval device wherein a plurality of card type items having edges with identifying code elements

are arranged on a storage rack which is moveable with respect to an item selector, and wherein one of said items is selected from said rack using said code elements while said rack is moving with respect to said selector, the improvement wherein there is provided an electric motor having first and second coils coupled to at least one toothed member for causing said movement, a switch arranged to be activated in response to selection of one of said items, and control means, including a counter activated by the teeth of said toothed member, for stopping said motor upon the counting of a selected number of teeth by said counter following activation of said switch, said control means includes means for briefly short circuiting one of said coils, thereby to rapidly stop said motor.

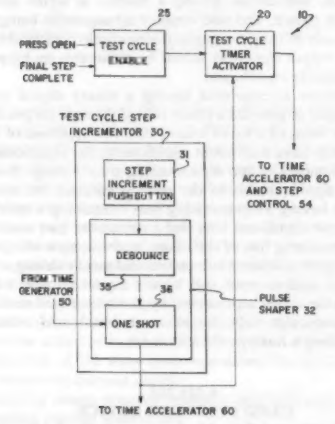


4,223,213

APPARATUS FOR RAPID DATA VERIFICATION OF A PROGRAMMABLE TIMER

Jeffrey N. Bibbee, Mogadore, Ohio, and Thomas W. Smith, Fort Myers Beach, Fla., assignors to McNeil Akron, Inc., Akron, Ohio

Filed May 22, 1978, Ser. No. 908,542
Int. Cl.[2] G06M *3/02*
U.S. Cl. 235—92 T **7 Claims**



1. Test apparatus for use with a timer for controlling a process having an operating cycle incorporating a plurality of sequential operational steps and for providing at least one preselectable output signal for each such step, comprising:

means for activating the execution of a test cycle by the timer at a time other than during the process operating cycle and providing a pulse output signal to the timer;

means for selective single step incrementing of the timer through the plurality of sequential operational steps; and,

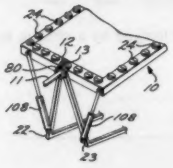
means for rapid verification of the operation of the timer and of each preselected output signal for each operational step, said means for selective single step incrementing of the timer inhibiting such incrementation until after said means for rapid verification has verified the operation of the timer and of each preselected output signal for the prior operational step.

4,223,214

SOLAR TRACKING DEVICE

Mark E. Dorian, San Diego, and David H. Nelson, Arroyo Grande, both of Calif., assignors to American Solar Systems, Inc., Arroyo Grande, Calif.

Filed Jan. 9, 1978, Ser. No. 867,984
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **15 Claims**



1. A tracking system for orienting a solar energy collector toward the sun comprising:

unshielded photosensitive means exposed to direct solar radiation for detecting misalignment of a solar energy collector relative to the sun beyond a preselected limit of tolerance and for generating output signals from each of said photosensitive means,

means for providing an error signal proportional to the ratio of the difference between the output signals of said photosensitive means to the sum of the output signals of said photosensitive means,

means responsive to said error signal to realign said collector relative to the sun to a position in advance of the normal orientation of the collector relative to incident radiation to anticipate solar movement, whereby said means responsive to said error signal remains inactive for the duration of an interval during which the sun undergoes relative movement with respect to said collector from a position trailing the orientation of said collector to a position leading the orientation of said collector, and

means for altering said preselected limit of tolerances uniformly relative to a plane perpendicular to said collector.

4,223,215

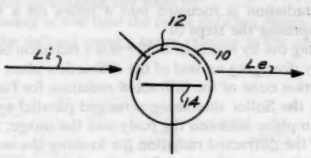
PHOTODETECTOR ARRANGEMENTS AND CIRCUITS

Morteza M. Chamran, Elmhurst, and Milan R. Dimovski, Chicago, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 19, 1978, Ser. No. 907,687
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—211 R **11 Claims**

1. An improved photodetector arrangement comprising photodetector means having a cathode which is at least semi-transparent to a light beam, said cathode having the capability of emitting electrons when positioned in said

light beam, said cathode being contoured and positioned relative to said light beam so that said light beam passes



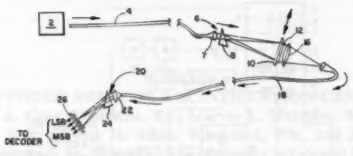
through said cathode at least twice while following a substantially single linear path.

4,223,216

MEANS FOR SENSING AND COLOR MULTIPLEXING OPTICAL DATA OVER A COMPACT FIBER OPTIC TRANSMISSION SYSTEM

William H. Quick, La Habra Heights; Kenneth A. James, Corona Del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 22, 1979, Ser. No. 5,620
Int. Cl.² G01J 3/34
U.S. Cl. 250—226 **21 Claims**



1. An optical sensing system comprising:

first light transmission means for transmitting a supply of broadband incident light signals,

light dispersing means to receive and spectrally disperse the incident light signals supplied by said first light transmission means,

transducer means aligned with said light dispersing means to receive at least some of the color signals that are spectrally dispersed thereby, said transducer means having associated means by which to transmit certain color signals and to absorb certain other color signals in response to an incident physical parameter to be sensed thereby, and

detector means responsive to the intensity of each of the color signals transmitted by said transducer means so as to provide an indication of the physical parameter.

4,223,217

FIBER OPTIC ELECTRIC SWITCH

James A. Bongard; Eugene F. Duncan, both of Milwaukee, and James R. Jaeschke, Greendale, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1977, Ser. No. 796,400
Int. Cl.² G02B 5/14
U.S. Cl. 250—227 **30 Claims**

1. A fiber optic switch comprising:

a housing;

first fiber optic cable means having an input end and an output end;

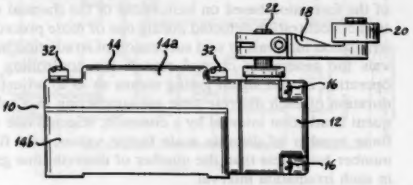
second fiber optic cable means having an input end and an output end;

mounting means mounting said output end of said first fiber optic cable means and said input end of said second fiber optic cable means within said housing in spaced end to end facing relation substantially colinearly aligned;

converter means including light source means adjacent said input end of said first fiber optic cable means, detector means adjacent said output end of said second fiber optic cable means and means responsive to the transmission of light from said light source means through said first and second fibre optic cable means to said detector means to perform an electrical switching function;

shutter means mounted for movement substantially perpendicular to the colinear axis of said facing ends of said first and second fiber optic cable means, said shutter means having a light-blocking portion movable into the gap between said facing ends to block the optical path therebetween and movable out of said gap to re-establish said path; and

operator means movably mounted to said housing and operatively connected to said shutter means for effecting said movement thereof,



wherein said mounting means also forms a narrow elongated guiding channel substantially perpendicular to said colinear axis of said facing cable ends and intersecting said gap therebetween, said shutter means being disposed in said channel, whereby said mounting means performs the dual functions of mounting said facing cable ends and guiding said movement of said shutter means to afford accurate lateral and axial positioning of said cable ends to minimize transmission losses in the gap therebetween and to afford precise optical switching, and

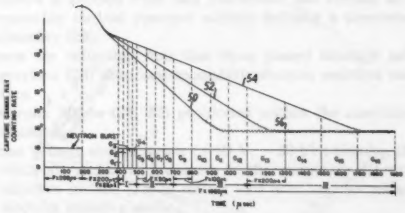
wherein said mounting means has linearly aligned detents formed on opposite sides of and axially spaced by said channel, said detents providing a tight fit of said facing cable ends to minimize tolerance deviations thereof, lateral and axial positioning of said facing cable ends being fixed relative to said mounting means independently of said housing.

4,223,218

METHODS AND APPARATUS FOR OPTIMIZING MEASUREMENTS OF THERMAL NEUTRON DECAY CHARACTERISTICS

Larry A. Jacobson, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 955,175
Int. Cl.² G01V 5/00
U.S. Cl. 250—262 **32 Claims**



1. Apparatus for detecting the decay with time of thermal neutrons in an earth formation for use in measuring thermal neutron decay characteristics of the formation, comprising:

means for irradiating an earth formation with a discrete burst

of fast neutrons during each of a succession of irradiation intervals;

detector means for detecting indications of the concentration of thermal neutrons in the formation following each neutron burst and for generating signals in response thereto;

signal gating means response to control signals and to said detector-generated signals for transmitting signals from the detector means during a contiguous sequence of discrete time gates during each irradiation interval, said sequence beginning following a discrete time delay after termination of the neutron burst in each irradiation interval and extending over substantially the remainder of the irradiation interval; and

control means responsive to a command signal related to the measurement of a thermal neutron capture characteristic of the formation based on indications of the thermal neutron concentration detected during one or more preceding irradiation intervals in said succession of irradiation intervals for generating control signals for controlling the operation of said signal gating means so as to adjust the duration of each discrete time gate occurring in a subsequent irradiation interval by a common, selected one of a finite number of discrete scale factor values, said finite number being less than the number of discrete time gates in each irradiation interval.

10. Apparatus for detecting the decay with time of thermal neutrons in an earth formation, comprising:

means for irradiating an earth formation with a discrete burst of fast neutrons;

detector means for detecting indications of the concentration of thermal neutrons in the formation following the neutron burst and for generating signals in response thereto; and

signal gating means for transmitting signals from the detector means during a time gate sequence which begins following a discrete time delay after termination of the neutron burst and which includes a plurality of contiguous groups of time gates, each group of which is itself comprised of a plurality of contiguous, discrete time gates, the durations of the time gates being substantially equal within each separate gate group and progressively increasing from group to group in said sequence.

4,223,219
METHOD OF AND APPARATUS FOR PRODUCING TEXTURE TOPOGRAMS

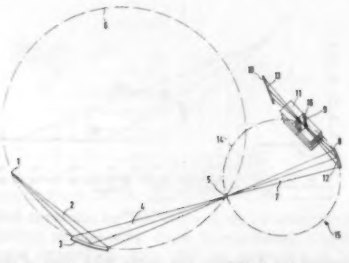
Eberhard Born, No. 19, Nederlinger Strasse, 8000 München 19, and Gerald Paul, No. 24, Harbigstrasse, 8672 Selb, berfranken, both of Fed. Rep. of Germany

Filed Oct. 24, 1978, Ser. No. 954,254

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748501

Int. Cl.² G01N *23/20*

U.S. Cl. 250—272 **18 Claims**



1. A method of producing texture topograms at surface layers of non-amorphous polycrystalline bodies in adaptation of the conventional Guinier method, wherein a divergent beam of monochromatic penetrating radiation is diffracted at the surface of a polycrystalline body in a diffraction plane and the diffracted radiation is focussed into a reflex on a focussing circle, comprising the steps of

(a) masking out by means of Soller slits a radiation beam only slightly diverging normal of the diffraction plane from the diffraction cone of the diffracted radiation for forming an image, the Soller slits being arranged parallel to the diffraction plane between the body and the image, and

(b) using the diffracted radiation for forming the image or a registration at a distance from the focussed reflex and from the body.

4,223,220
METHOD FOR ELECTRONICALLY IMAGING THE POTENTIAL DISTRIBUTION IN AN ELECTRONIC COMPONENT AND ARRANGEMENT FOR IMPLEMENTING THE METHOD

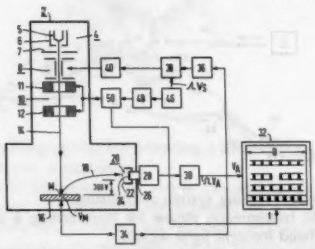
Hans P. Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,493

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813948

Int. Cl.² G01N *23/00*

U.S. Cl. 250—310 **4 Claims**



1. A method for electronically imaging the potential distribution in an electronic component by contactless potential measurements with a scanning electron microscope, the primary electron beam of which is keyed and is scanned across the component in lines to form a raster by deflection means, and for display as potential contrast on a picture screen scanned in synchronism therewith, comprising:

(a) shifting the phase of the pulses of the primary electron beam over a range of time delays with respect to a reference phase of the potential distribution in the component;

(b) using a multiple of the frequency of the line deflection of the primary electron beam on the component as the frequency of shifting the time delay; and

(c) causing the shifting of the phase over a range of time delays to be synchronous with the line deflection.

4,223,221
SCINTILLATION CAMERA UNIFORMITY CORRECTION

Michael R. Gambini, Wallingford, Conn., and Gary Benenson, Brooklyn, N.Y., assignors to Picker Corporation, Cleveland, Ohio

Filed Jun. 19, 1978, Ser. No. 917,070

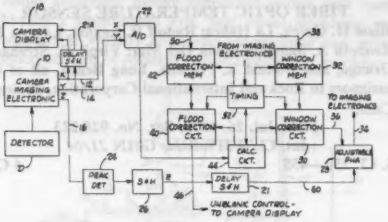
Int. Cl.² G01T *1/20, 1/208*

U.S. Cl. 250—363 S **23 Claims**

1. A method of correcting for nonuniformity in imaging of a scintillation camera, the camera having means for producing, in response to radiation events, radiation count signals indicating the location and energy level of associated radiation events, and means for defining an energy range for discarding counts representing events having an intensity outside the defined

energy range, and means for producing a display representing radiation events in response to undiscarded radiation counts, said method comprising the steps of:

(a) adjusting in real time the range defining means for adjusting the defined energy range relative to the energy level



indications in response to the occurrance of each count as a function of the location of the count, and

(b) adjusting the response of the camera as a function of location to uniform radiation within its field of view to compensate for regional variations in the sensitivity of the camera within the field.

4,223,222

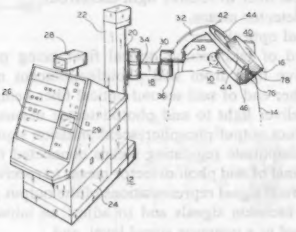
SUSPENDED ARM FOR A SCINTILLATION CAMERA

David A. Gray, Louisville, Ky.; Marvin L. Sivertsen, Milwaukee, Wis.; Jerome H. Adam, Waukesha, Wis., and John F. Prendergast, Sr., Franklin, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Sep. 28, 1978, Ser. No. 946,586

Int. Cl.³ G01T *1/20*; G12B *9/00*

U.S. Cl. 250—363 S **10 Claims**



1. A suspended arm for use with a scintillation camera device having a suspension system for positioning a detector head attached to said suspended arm for imaging a portion of a patient, said suspended arm comprising:

a rigid member having a yoke at one end thereof, said yoke having a base with ends adapted to pivotally retain the detector head at pivot points, and

means for attaching the other end of said rigid member to the suspension system,

said rigid member having a shape which extends from said attaching means generally upwardly to the base of said yoke and extends from the base of said yoke generally downwardly to the ends thereof to provide clearance for the patient between said attaching means and said pivot points whereby said rigid member can be extended over the patient for imaging a portion of the far side of the patient.

4,223,223

BROAD-RANGE ION MASS SPECTROMETER

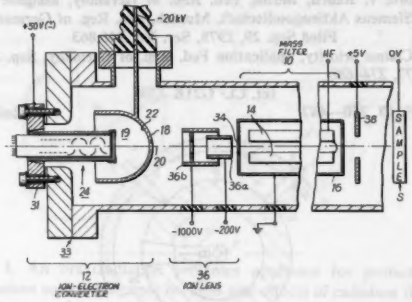
Wolfgang O. Hofer, Garching; Jürgen Kirschner, Aachen, and Franz Thum, Garching, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zür Foerderung der Wissenschafter e.V., Goettingen, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,755

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753412

Int. Cl.² H01J *3/14*

U.S. Cl. 250—397 **11 Claims**



1. Broad-range ion mass spectrometer for analysis of ions in a predetermined energy range comprising the combination of

a mass filter **(10)**

with an ion-electron converter **(12)**,

the filter **(10)** and ion-electron converter **(12)** in said combination providing, inherently, for energy filtering in which the mass filter **(10)** provides for high-pass filtering above said range and the ion-electron converter inherently for low pass filtering below said range,

and wherein

the mass filter **(10)** includes

ion beam generating means **(38)** to generate an essentially linear ion beam derived from the ion emitting sample (S),

and a high-frequency mass filter **(14, 16)** and rejecting ions having an energy level above the high end of said range passing the essentially linear ion beam therethrough

and wherein the ion-electron converter **(12)** includes a reflection or mirror-type ion-electron converter of generally rotation symmetrical shape with respect to an axis, said ion-electron converter having its axis aligned with said essentially linear ion beam of the high-frequency mass filter **(10)**, having

an electrode **(18)** having an aperture **(20)** adapted to be traversed by the beam of ions from the ion source (S) after having passed through the filter **(10)**, the electrode **(18)** having an electron emissive surface **(22)** on a side thereof which is averted from said ion source and formed as a smoothly curved concave surface defining a converter chamber **(19)**,

means for reflecting ions that have passed through said aperture **(20)** unto said secondary electron emissive surface,

electrode means **(30, 32)** positioned within the converter chamber,

a bias voltage source means (+50 V; −20 kV) biassing the electrode means with respect to the secondary electron emissive surface **(22)** to reflect ions unto said secondary electron emissive surface,

and a secondary electron detector **(24, 26, 28)** to detect secondary electrons ejected from the secondary electron emissive surface by said ions, located within the converter chamber and positioned with respect to the secondary electron emissive surface **(22)** to be essentially surrounded by at least a portion thereof, and providing an output

signal which will inherently be representative only of ions having an energy level above the low end of said range, whereby the output of the secondary electron detector will be representative of the ions emitted by said sample within said energy range.

4,223,224

CHARGED-PARTICLE BEAM OPTICAL APPARATUS INCLUDING A DAMPED SUPPLEMENTAL OSCILLATOR FOR THE SPECIMEN HOLDER THEREOF

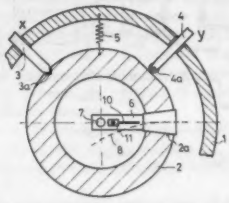
Moriz v. Rauch, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 946,863

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744680

Int. Cl.² G21K *5/06*

U.S. Cl. 250—442 **7 Claims**



1. In a charged-particle beam optical apparatus including a specimen holder which is mounted in at least one support member of the apparatus and vibrates when the support member is subjected to shock, the improvement comprising at least one damped oscillator means coupled to said specimen holder at approximately the point of maximum vibration amplitude of said specimen holder, to eliminate interfering soil vibrations within said specimen holder.

4,223,225

TOMOGRAPHIC SYSTEM HAVING A SINGLE CASE ON WHICH ARE CARRIED THE X-RAY TUBES AND DETECTORS

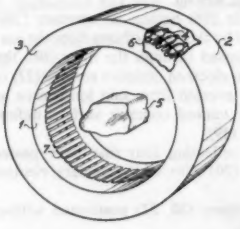
Andre Laffitte, and Jacques Delair, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed May 11, 1979, Ser. No. 38,332

Claims priority, application France, May 16, 1978, 78 14406

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **7 Claims**



7. An apparatus for use in a computer-driven transverse axial tomographic system comprising a hollow annular-shaped case adapted to be positioned around a body whose tomograph is to be taken, comprising a plurality of X-ray tubes positioned inside said case one next to the other and for directing their X-ray beams through windows in the case wall toward the body;

a plurality of circuits mounted inside said case for starting each of said X-ray tubes;

a plurality of X-ray detectors positioned on the case between the windows opposite the plurality of tubes for receiving the X-ray beams after they have passed through the body; and commutation means for controlling the starting circuits and thus of said X-ray tubes.

4,223,226

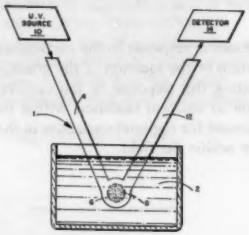
FIBER OPTIC TEMPERATURE SENSOR

William H. Quick, La Habra; Rudolf R. August, Laguna Beach; Kenneth A. James, Corona Del Mar; Virgil H. Strahan, Jr., Orange, and Donald K. Nichols, Long Beach, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1978, Ser. No. 928,223

Int. Cl.² F21V *9/16*; G01N *21/64*

U.S. Cl. 250—458 **4 Claims**



1. A pulse-width-modulated temperature sensor comprising:

a source of light pulses,

a first optical fiber,

one end of said first optical fiber being positioned in proximity to said source of light pulses to receive light pulses therefrom,

a supply of photoluminescent material which has an emission amplitude decay rate which is a function of a temperature to be sensed to which said phosphor is exposed, said phosphor being located in proximity to another end of said first optical fiber to receive light therefrom,

photodetector means,

a second optical fiber,

one end of said second optical fiber being positioned to receive light from said photoluminescent material and another end of said second optical fiber being positioned to deliver light to said photodetector means, thereby to conduct output phosphorescent emission signals thereto,

signal amplitude regulating means connected to an output terminal of said photodetector means to receive therefrom electrical signal representations of the output phosphorescent emission signals and to adjust an initial amplitude thereof to a common signal level, and

pulse width detector means connected to an output terminal of said signal amplitude regulating means, said pulse width detector being connected to measure the width of the amplitude adjusted signal representations of the output emission signals, whereby the width of said adjusted signal representations is indicative of the temperature to be sensed.

4,223,227

LASER ALIGNMENT FIXTURE

Norman H. Horwitz, West Bloomfield, Mich., assignor to William Beaumont Hospital, Royal Oak, Mich.

Continuation-in-part of Ser. No. 770,558, Feb. 22, 1977, Pat. No. 4,123,660. This application Jun. 22, 1978, Ser. No. 918,174

The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.

Int. Cl.² G01B *11/26*; G01N *21/00, 23/00*

U.S. Cl. 250—491 **8 Claims**

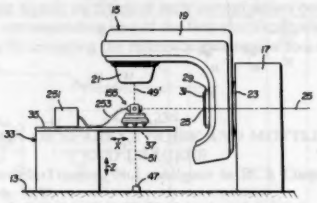
5. An alignment fixture particularly for alignment of high

energy sources including lasers, comprising a centrally apertured support base mountable upon a support;

a centrally apertured turntable journalled upon said support base;

a mount on and secured to said turntable having side walls, top and bottom walls and a longitudinal opening;

a visual alingment means supported within said opening having a longitudinal axis, said visual alignment means adapted to visually align said longitudinal axis with the epicenter axis of rotation of said teletherapy machine, said



support base being adjustably mounted for rotational alignment of said visual alignment means; said head adapted to direct a radial high energy beam at right angles to and intersecting said epicenter axis at an isocenter;

and a mirror mounted on each of said mount walls, with their central axes passing through said longitudinal axis;

said mirrors being adapted to reflect the beams of a series of right-angularly related pairs of opposed light sources spaced therefrom to verify by the reflection of said beams upon said mirrors with the respective beams all intersecting said isocenter.

4,223,228

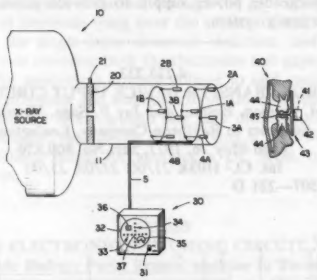
DENTAL X-RAY ALIGNING SYSTEM

Jerome I. Kaplan, Indianapolis, Ind., assignor to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Filed Jun. 21, 1979, Ser. No. 50,705

Int. Cl.[2] H05G *1/30*

U.S. Cl. 250—491 **16 Claims**



16. A dental x-ray aligning system for aiming a dental x-ray apparatus at an x-ray film plate comprising:

a. a magnet;

b. magnet positioning means for maintaining said magnet in a fixed relation with an x-ray film plate;

c. at least three magnetic field sensors;

d. probe positioning means for maintaining said magnetic field sensors in fixed relation to the dental x-ray apparatus;

e. detection means for detecting and measuring magnetic field strengths sensed by said magnetic field sensors; and

f. indicator means for comparing the detected magnetic field strengths and for indicating alignment of the dental x-ray apparatus with the x-ray film plate.

4,223,229

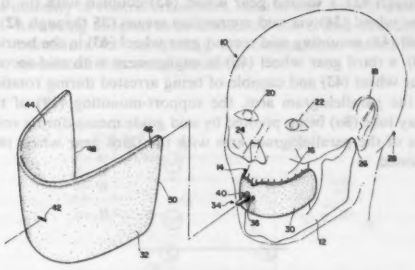
ORAL RADIATION PROTECTOR APPLIANCE

Thomas M. Persico, 1323 Rostraver St.; Richard M. Dudas, 38 Jefferson Dr., and George W. Shusta, 25 Pennsylvania Blvd., all of Monessen, Pa. 15062

Filed Nov. 30, 1978, Ser. No. 964,968

Int. Cl.[2] G21C *11/00*; G21F *3/00*

U.S. Cl. 250—515 **15 Claims**



1. An oral radiation protector appliance for protecting human anatomy against harmful side effects of radiation therapy comprising an intraoral portion and an extraoral portion, said portions being formed of material substantially impervious to penetration therethrough of radiation rays, said intraoral portion substantially covering and protecting the frontal, upper and rear surfaces of the teeth, the gingiva and periodontal bone, the extraoral portion covering extraoral areas of the face and protecting the parotid and sublingual and salivary glands.

4,223,230

X-RAY EXAMINATION APPARATUS

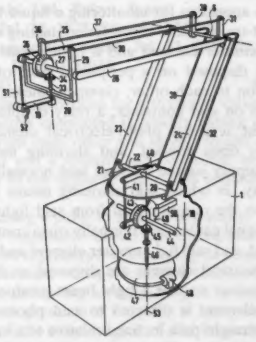
Hans Waerve, Sollentuna, and Sten Djurson, Stockholm, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,413

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745883

Int. Cl.[2] H01J *35/16*

U.S. Cl. 250—523 **5 Claims**



1. An x-ray examination apparatus comprising a parallelogram arm whose one end is mounted by a bearing, and whose other end bears, via a support-mounting, an x-ray tube with a radiation diaphragm wherein the parallelogram arm can be rotated about a vertical axis and can be moved in a vertical direction, such that the central ray of the x-ray tube retains its

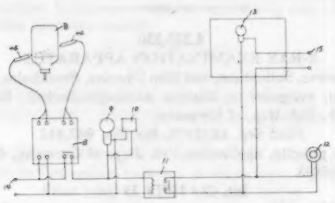
direction, characterized in that guide means (33–46) are arranged in the parallelogram arm between the bearing (18) and the x-ray tube support-mounting (19), said guide means (33–46), when the parallelogram arm (FIG. 3) is rotated about the vertical axis (53), being operable to displace the x-ray tube (8*a*) such that the sides of the field (17) diaphragmed-in by means of the radiation diaphragm (8*b*), are parallel-displaced, said guide means comprising a vertically arranged shaft (33), a first gear wheel (34) secured thereon, connection means (35 through 42), a second gear wheel (43) coupled with the first gear wheel (34) via said connection means (35 through 42), a shaft (44) mounting said second gear wheel (43) in the bearing (18), a third gear wheel (45) in engagement with said second gear wheel (43) and capable of being arrested during rotation of the parallelogram arm, the support-mounting (19) of the x-ray tube (8*a*) being pivoted by said guide means during rotation of the parallelogram arm with the third gear wheel (45) arrested.

4,223,231

LIQUID LEVEL MONITOR APPARATUS

Hajime Sugiyama, No. 3, 2 Banchi, Aza Itchota Tosaki-Cho, Okazaki, Japan

Filed Jul. 24, 1978, Ser. No. 927,163
Claims priority, application Japan, Sep. 17, 1977, 52-111930
Int. Cl.³ G01N *15/06*
U.S. Cl. 250—577 **6 Claims**



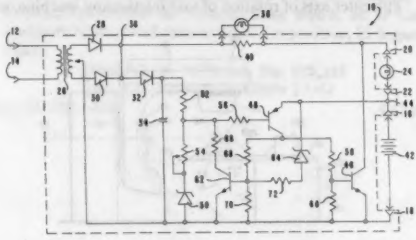
1. An apparatus for monitoring a liquid level in an upstanding light-transmissive container containing a liquid, comprising a light emitter element and a light sensitive photo-electrical element disposed on a peripheral wall of said container in opposition to each other, clamping means for mounting said elements on said container, a relay coupled to the output of said light sensitive photo-electrical element and, having a normally open contact, and alarming means coupled to a power supply source through said normally open contact of said relay, in which said alarming means is energized in response to the output signal from said light sensitive element which signal causes said normally open contact of said relay to be closed, and said light emitter element and said light sensitive photo-electrical element are disposed at different heights of said container so that a light beam produced from said light emitter element is directed to said photo-electrical element along a straight path inclined relative to a longitudinal vertical axis of said upstanding container in which upon lowering of said liquid level in said container to a level at which said light beam does not intersect said liquid surface, said light sensitive element produces said output signal to assure detection of said liquid level with reference to a predetermined position along said vertical longitudinal axis of said container regardless of whether said liquid is transparent, translucent or opaque.

4,223,232

BATTERY CHARGING CIRCUIT FOR AN EMERGENCY SYSTEM

Bülent Bulat, New Haven, Conn., assignor to Chloride Incorporated, North Haven, Conn.

Filed May 31, 1978, Ser. No. 911,233
Int. Cl.² H82J *7/10*
U.S. Cl. 307—66 **10 Claims**



1. A battery charging circuit for an emergency system comprising:

(a) AC terminals for receiving an AC charging signal;

(b) DC terminals for receiving a rechargeable power supply;

(c) charging means coupled to said AC terminals for providing a DC charging signal to said DC terminals capable of charging said power supply;

(d) load terminals for receiving an emergency system;

(e) a multi-function single active element coupled across said DC terminals and said load terminals and having the capacity to shunt current from said DC terminals and said load terminals; and

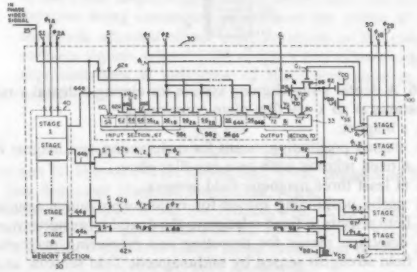
(f) control circuit means for enabling said single active element to regulate the voltage across said DC terminals during the presence of said AC charging signal at said AC terminals and to shunt current from said DC terminals and said load terminals when said rechargeable power supply maintains a full-charge value, and for enabling said single active element to complete a current path between said DC terminals and said load terminals upon loss of said AC charging signal at said AC terminals thereby allowing said rechargeable power supply to provide power for said emergency system.

4,223,233

CHARGE TRANSFER DEVICE INPUT CIRCUITRY

Arthur M. Cappon, Boston, and Jay P. Sage, Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 26, 1977, Ser. No. 800,829
Int. Cl.² H03K *21/00, 23/08, 25/00*
U.S. Cl. 307—221 D **4 Claims**



1. In combination:

(a) a charge transfer device having a source region, an equili-

bration region, and an isolation gate region disposed contiguously to the source region and the equilibration region, such equilibration region including a reference gate region and an input signal gate region;

(b) means for coupling the input signal gate region to an input signal;

(c) means for coupling the source region to a source of first electrical pulses;

(d) means for coupling the isolation gate region to a source of second electrical pulses, the time duration of such second electrical pulses being related to the bandwidth of the input signal, each one of such second pulses occurring after a corresponding one of the first electrical pulses; and

(e) means for coupling the reference gate region to a voltage source.

4,223,234

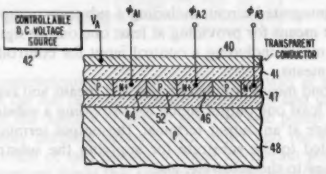
REDUCTION OF SPARKLE NOISE AND MOTTLING IN CCD IMAGERS

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1979, Ser. No. 35,346

Int. Cl.³ G11C *19/28;* **H01L** *29/78, 27/14, 29/04*

U.S. Cl. 307—221 D **7 Claims**



1. A charge-coupled device (CCD) imager comprising:

a semiconductor substrate;

a single layer electrode structure lying over and insulated from one surface of said substrate, said structure comprising semiconductor electrodes of one conductivity type spaced from one another by semiconductor "gaps" of opposite conductivity type;

means for controlling, at a desired level, greater than zero, the conduction of current through the gaps comprising a control electrode lying over the surface of and insulated from the single layer electrode structure, said control electrode covering both the electrodes and gaps; and

means for applying a control voltage to said control electrode of a sense and amplitude to produce current flow at said desired level through said gaps during operation of said imager, said means for applying a control voltage comprising means for applying a DC level, open-loop fashion.

4,223,235

ELECTRONIC SWITCHING CIRCUIT

Jean-Claude Rufray, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 12, 1978, Ser. No. 941,577

Claims priority, application France, Sep. 16, 1977, 77 28070

Int. Cl.³ H03K *17/56*

U.S. Cl. 307—241 **16 Claims**

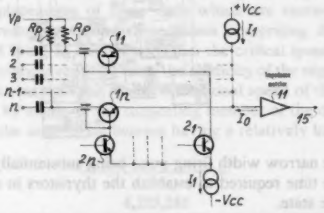
1. An electronic switching circuit for controllably transferring signals between a plurality of switched terminals and a pole terminal, said electronic switching circuit comprising:

a plurality of switching transistors, each switching transistor coupling an associated one of said switched terminals with said pole terminal, for controllably transferring a signal between an associated switched terminal and said pole terminal;

a plurality of directional transistors, each coupled to an associated one of said switching transistors, for controlling the switching of said associated switching transistors;

first and second current sources, said first current source coupled to each of said switching transistors and said second current source coupled to each of said directional transistors, said first and second current sources for providing a constant current to a switching transistor, the conductance states of said directional transistors determining which one of said switching transistors receives said constant current;

a plurality of control transistors, each of said control transistors being coupled to an associated one of said directional transistors for controlling the conductance state of an associated directional transistor;



a plurality of control terminals, each of said control terminals being coupled to an associated one of said control transistors for controlling said electronic switching circuit; and

a prioritizing circuit for establishing a priority among said switched terminals, comprising a voltage divider circuit having a plurality of voltage nodes, each of said nodes being coupled to an associated directional transistor, whereby the lowest priority terminal of said switched terminals is switched to said pole terminal in the absence of signals at any of said control terminals, and the order of priority among the switched terminals other than said lowest priority terminal is determined in accordance with the connection of said control transistors to respective associated nodes.

4,223,236

GATE CONTROLLING APPARATUS FOR A THYRISTOR VALVE

Ryuji Iyotani, and Atsumi Watanabe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1978, Ser. No. 924,007

Claims priority, application Japan, Jul. 13, 1977, 52/82989

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 Q **6 Claims**

1. A gate controlling apparatus for a thyristor valve including a plurality of series connected thyristors having different holding currents from each other and series circuits each including a capacitor and a resistor and connected in parallel with each thyristor of the thyristor valve, said apparatus comprising:

means for generating a pulse to fire the thyristors;

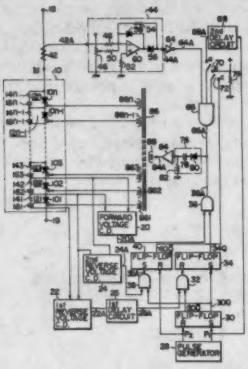
forward voltage responsive means connected across a selected one of the thyristors for producing an output signal indicative of forward voltage condition thereacross;

circuit means for producing an output signal in response to the simultaneous presence of the pulse of said pulse generating means and the output signal of said forward voltage responsive means;

current responsive means for producing an output signal when a current of the thyristor valve exceeds a predetermined current value higher than the highest holding current among those of the thyristors of the thyristor valve; and

pulse supplying means for providing a narrow width firing

pulse to each of the thyristors of the thyristor valve in response to at least one of the output signals of said circuit means and said current responsive means, the duration of



the narrow width firing pulse being substantially equal to the time required to establish the thyristors in a conductive state.

4,223,237

TRIGGER PULSE FORMING CIRCUIT

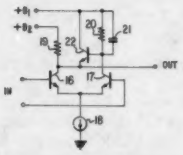
Tsuneo Yamada, and Yukihiko Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,640

Claims priority, application Japan, Mar. 15, 1978, 53-29650; Mar. 15, 1978, 53-29651

Int. Cl.[2] H03K *5/08*

U.S. Cl. 307—268 **6 Claims**



1. A trigger pulse forming circuit comprising

a first power supply;

a second power supply having a common polarity with said first power supply whose voltage level is different than that of said first power supply;

a differential amplifier including a first transistor whose operating voltage is supplied from the first power supply and a second transistor whose operating voltage is supplied from a second power supply, at least said first transistor being adapted for application thereto of an input pulse signal;

a load resistor connected between an output terminal of said first transistor and said second power supply;

an integrating circuit connected between an output terminal of said second transistor and said first power supply; and

a third transistor whose base and collector are connected respectively to opposite ends of said integrating circuit and its emitter is connected to the output terminal of said first transistor whereby the trigger pulse output is obtained from the output terminal of said first transistor.

4,223,238

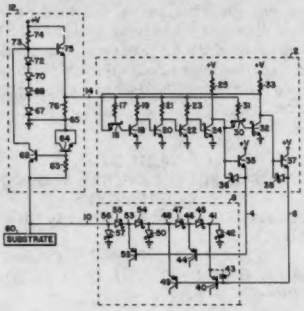
INTEGRATED CIRCUIT SUBSTRATE CHARGE PUMP

Ward D. Parkinson, Dallas, Tex., and Walter C. Seelbach, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1978, Ser. No. 934,642

Int. Cl.[2] H03K *1/02, 1/12, 3/64, 3/26*

U.S. Cl. 307—297 **7 Claims**



1. An integrated circuit including a substrate comprising:

(a) first means for providing at least one output signal, such first means including a control input for controlling said first means,

(b) second means coupled to said first means and responsive to at least one output signal for providing a substrate bias voltage at an output terminal, the output terminal being coupled to the substrate for applying the substrate bias voltage to the substrate, and

(c) feedback means coupled to the substrate and to said first means for sensing the substrate bias voltage and for providing enabling and disabling signals to the control input for selectively enabling and disabling said first means, said feedback means including a zener diode responsive to the substrate bias voltage having a non-conductive mode and a breakdown mode, and switching means responsive to said zener diode for applying said enabling signal to aid control input when said zener diode is in said nonconductive mode and for applying said disabling signal to said control input when said zener diode is in said breakdown mode.

4,223,239

MULTIPHASIC PUMP FOR ROTATING CRYOGENIC MACHINERY

Phillip W. Eckels, Pittsburgh, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 750,794, Dec. 15, 1976, Pat. No. 4,120,169.

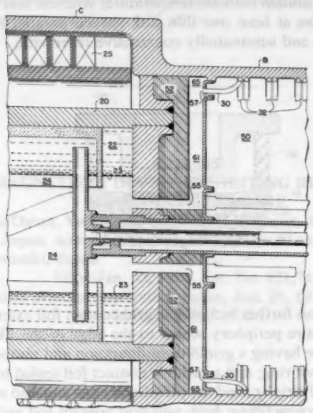
This application May 25, 1978, Ser. No. 909,333

Int. Cl.[3] H02K *9/00*

U.S. Cl. 310—52 **3 Claims**

1. A superconducting generator rotor including at least one torque tube for communicating torque to said rotor and supporting the weight of said rotor; windings mounted to said rotor; means for supporting a multiphasic refrigerant system within the interior of said rotor including a cylindrical chamber, an inlet for liquid refrigerant, said liquid refrigerant defining a pool at the periphery of said cylindrical chamber, and an outlet for gaseous refrigerant, said gaseous refrigerant defining a cylindrical core coaxial with said cylindrical chamber, and a pump communicated to said outlet for extracting gaseous refrigerant, said pump including a pump housing, said pump housing rotatable about an axis substantially coincident to the axis of said cylindrical chamber; said pump housing defining at least one passageway extending from a first end adjacent the axis of rotation of said pump housing to an opposite end radi-

ally remote from the axis of rotation of said pump housing; a gaseous helium inlet communicated to said gaseous refrigerant core at one end and to said axially adjacent portion of said passageway at the opposite end to provide for the inflow of gaseous refrigerant from said core to said pump; a gaseous refrigerant outlet removed axially outward from said inlet, said



outlet communicating to said pump passageway at a distance less than the full radially outward distance of said pasageway to permit the outflow of helium gas from said pump; and, said passageway defining between said outlet and the axially remote portion of said passage a liquid refrigerant storage volume to prevent liquid that penetrates in said inlet from gaining access to said pump outlet.

4,223,240

FLYWHEEL SET FOR ACCUMULATING KINETIC ENERGY OF ROTATION

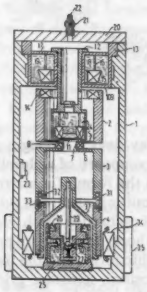
Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

Continuation of Ser. No. 749,268, Dec. 10, 1976, abandoned. This application Feb. 28, 1979, Ser. No. 15,918

Claims priority, application Netherlands, Dec. 18, 1975, 7514748

Int. Cl.[2] H02K *7/02*

U.S. Cl. 310—74 **1 Claim**



1. In combination with a rotatable substantially vertical high speed flywheel rotor assembly for accumulating kinetic energy of rotation, the rotor assembly having an upper extremity supported with the aid of a magnetic radial bearing having a polarly magnetized ring mounted concentrically to the upper end of the rotor assembly so as to rotate with the rotor assembly, a stationary identically polarized magnetic upper ring arranged concentrically to the rotatable ring and separated from the rotatable ring by a gap whereby the stationary and rotatable rings face each other and magnetically attract each other to support the rotor assembly and stabilize the rotor assembly against radial movement, an electric motor generator unit having an electrical stator concentric with and surrounding the rotor assembly for performing a motor function as well as a generator function, lower support means including axial thrust bearing means engageable with the lower part of the rotor assembly for rotational support of the rotor assembly, upper support means at the upper end of the rotor assembly for rotational support of the upper part of the rotor assembly, said supporting means at both rotor ends having means, permitting radial displacements of these ends which are corrected by centring restoring forces, these means comprising damping means and being so dimensioned that the critical speed of the rotor assembly as resulting from the elasticity of the supporting means is lower than the lowest operational speed of the rotor assembly, by means of the supporting member of the damping means of the axial thrust bearing having a relatively low resilience.

4,223,241

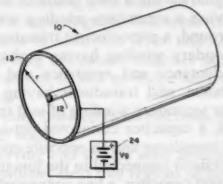
ELECTROSTATIC CHARGE GENERATOR

Aleksy J. Paszyc; Kwang T. Huang, both of Ventura, and Dallas M. Shiroma, Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1978, Ser. No. 937,646

Int. Cl.[3] H02N *1/10*

U.S. Cl. 310—308 **10 Claims**



1. An electrostatic charge generator for continuously providing charge carriers of a given polarity in a flow of dielectric liquid, comprising:

a. a coaxial tube comprising:

1. an inner conductor wire; and
2. a hollow, cylindrical outer conductor coaxial with said inner conductor;

b. voltage means for applying a DC potential between said inner and said outer conductor; said DC potential creating a non-uniform field the intensity of which is highest near said inner conductor;

c. a circulating dielectric liquid;

d. flow means for causing said dielectric liquid to continuously circulate through said coaxial tube at a rate to insure a turbulent flow;

e. said dielectric liquid being depleted of charges of the opposite polarity of said inner conductor more rapidly then complementary charges are removed at the outer conductor as the dielectric liquid is caused to flow through said coaxial tube, such that the dielectric liquid exiting said coaxial tube carries charges of the complementary polarity;

f. the polarity of said voltage means operable to be reversed for changing the polarity of the charges carried by said dielectric liquid and thus control the polarity of the accumulated charges; and

g. said dielectric liquid comprising a two-phase mixture con-

sisting of from 90 to 100 percent oil and from 0 to 10 percent distilled water.

4,223,242

METHOD AND CIRCUIT FOR DRIVING A PIEZOELECTRIC TRANSDUCER

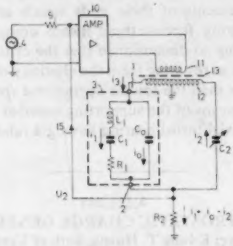
Horst Redlich; Werther Hartmann, both of Berlin, and Gerhard Dickopp, Hanover, all of Fed. Rep. of Germany, assignors to Ted Bildplatten AEG Telefunken, Switzerland

Filed Oct. 25, 1978, Ser. No. 954,605

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747851

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—316 **7 Claims**



1. An apparatus for reducing a resonance peak in a piezoelectric transducer for mechanically recording a signal having a band width of several MHz, in particular on a video disk, comprising, a signal generator having output terminals, a transformer having a primary winding connected to the output terminals of said signal generator, said signal generator generating a video signal having a band width of several MHz, said transformer having a secondary winding with a central tap connected to ground, a piezoelectric transducer connected to one end of secondary winding having a characteristic series capacitance, inductance and resistance and a characteristic parallel capacitance, said transducer having a first terminal connected to the secondary winding of said transformer and a second terminal, a capacitor connected between said second terminal of said transducer and an opposite end of said secondary winding, a resistor connected to the junction between said transducer and said capacitor, a line connected between one of the terminals of said signal generator and said junction, whereby a current in said parallel capacitance of said transducer is counteracted by a current in said capacitor for reducing the resonance peak of said piezoelectric transducer.

4,223,243

TUBE WITH BONDED CATHODE AND ELECTRODE STRUCTURE AND GETTER

David W. Oliver, and Norman T. Lavoo, both of Schenectady, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

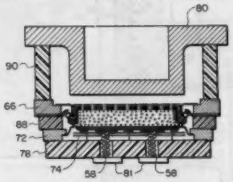
Filed May 9, 1979, Ser. No. 37,256

Int. Cl.[3] H01J *1/88, 19/42*

U.S. Cl. 313—268 **5 Claims**

1. Apparatus in an electron discharge device having a unitary heater, cathode, and control grid structure which comprises cathode formed from a circular disk of porous refractory metal having two spaced parallel outer surfaces and a peripheral edge, an inorganic insulating layer including boron nitride covering the surfaces of said disk except for a strip around part of the peripheral edge, and a film of refractory metal overlying substantially all of said insulating layer, the film on one surface having a gridlike configuration, the film on the other surface having a configuration of a heating element, said disk containing thermionic emissive material, and the insulating layer on said one surface having openings extending into the porous disk corresponding to the openings in the gridlike configuration of said film, whereby when the heating element is heated, electrons are directed through said openings in the insulating layer and the film on said one surface,

the improvement comprising getter means mounted near the heating element to function both as a getter to pump evolved nitrogen gas and as a heat shield reducing the heater power required to maintain cathode temperature, wherein said getter means includes at least one thin disk spaced parallel to said other surface and substantially coextensive therewith;



said apparatus further including a grid contact foil extending around the entire periphery sealed to the edge of the film on the one surface having a gridlike configuration and also sealed to a grid contact ring; and a cathode contact foil sealed to said cathode at said strip around the peripheral edge and also sealed to a cathode contact ring; both said grid contact foil and said cathode contact foil being of thin metal with slots which permit passage of said nitrogen gas from the insulating layer on said one surface to said getter means.

4,223,244

FLUORESCENT DISPLAY DEVICE WITH POSITION SELECTING AND COLUMN/ROW SELECTING GRIDS

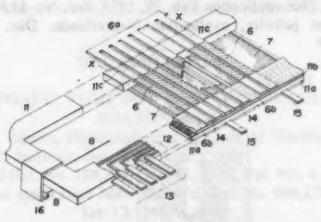
Takao Kishino; Kishio Kawasaki, and Nobuo Yamaguchi, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Oct. 16, 1978, Ser. No. 951,388

Claims priority, application Japan, Oct. 18, 1977, 52/124114; Sep. 7, 1978, 53/109111

Int. Cl.[2] H01J *1/46, 1/90, 63/06*

U.S. Cl. 313—497 **7 Claims**



1. In a fluorescent display device having a plurality of pattern display sections each composed of a plurality of phosphor-coated anodes arranged in the form of a matrix, and at least a filamentary cathode for emitting electrons when heated, said anodes being selectively bombarded with electrons emitted from said filamentary cathode thereby to produce a visual display of characters, graphic forms and the like, the improvement which comprises: position-selecting grids provided between said filamentary cathode and said pattern display section, one for each of said pattern display sections; column-selecting grids or row-selecting grids provided above, along and opposite to the columns or rows of said anodes of said pattern display sections, one for each of the columns or rows of said anodes; and a frame member provided on its surface facing said filamentary cathode with said position-selecting grids and

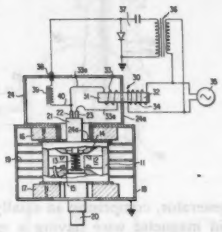
on its surface facing said pattern display sections with said column-selecting grids or said row-selecting grids, and at least the portions of said frame member where said grids are mounted being made of insulating material; said frame member being composed of a plurality of cross members of insulating material on which said grids are mounted, and a plurality of side members made of material having almost the same thermal expansion properties as said grids.

4,223,245

MAGNETRON DEVICE EXHIBITING REDUCED MICROWAVE LEAKAGE

Koichi Ogura, Yokohama, and Tokuju Koinuma, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 23, 1978, Ser. No. 871,743
Claims priority, application Japan, Jan. 21, 1977, 52/5478
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.51 **5 Claims**



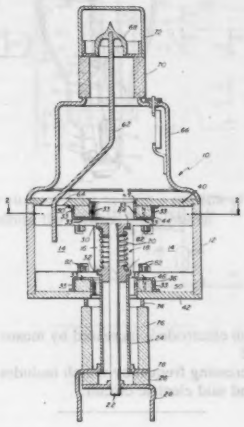
1. A magnetron device comprising,
a cylindrical anode including a plurality of anode vanes therein;
a cathode disposed on the axis of the cylindrical anode;
a cathode stem holding the cathode and having cathode lead terminals;
a magnet disposed so as to provide a magnetic field substantially parallel to the axis in an interaction space formed between the cathode and the vanes;
a high frequency shield box covering the cathode stem and confining therein high frequency noise leaking out through the cathode lead terminals; and
an energizing power supplying means for supplying energizing power from a commercial power source to the cathode lead terminals, wherein the energizing power supplying means comprises a cathode heating circuit including a transformer having a core and primary and secondary coils disposed on said core, the primary and the secondary coils of the transformer being disposed at the outside and the inside of the shield box respectively and inductively coupled with each other through the shield box, said energizing power supplying means further comprising a high voltage circuit supplying high voltage between the cathode and the anode, said high voltage circuit comprising a transformer capable of being coupled to a commercial power source, wherein the transformer of said high voltage circuit is disposed outside said shield box, and a filter circuit coupling said high voltage circuit transformer to said cathode and said anode, said filter circuit comprising a feedthrough capacitor mounted in a wall of said shield box and an inductor connected in series with said feedthrough capacitor in said shield box.

4,223,246

MICROWAVE TUBES INCORPORATING RARE EARTH MAGNETS

John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 812,100, Jul. 1, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 3,052
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.71 **5 Claims**



1. A microwave tube comprising:
an evacuated envelope containing an anode structure having a plurality of resonators formed therein and surrounding a central bore containing a cathode; and
means for producing a magnetic field transverse to the direction of motion of electrons from said cathode to said anode comprising permanent magnets supported wholly within the vacuum in said envelope adjacent the ends of said cathode;
said magnets being shielded from electrons emanating from said cathode; and
said cathode having end shields with annular grooves providing substantially field free regions adjacent the ends of said cathode.

4,223,247

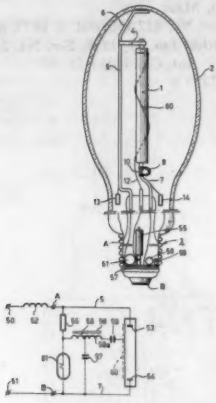
METAL VAPOR DISCHARGE LAMP

Cornelis A. J. Jacobs, and Jaap Rozenboom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 788,448, Apr. 18, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,023
Claims priority, application Netherlands, May 5, 1976, 7604760
Int. Cl.[2] H05B *41/19*; H01J *17/34*
U.S. Cl. 315—57 **4 Claims**

1. A metal vapor discharge lamp, for operation with an associated A.C. voltage supply, which comprises:
a discharge tube;
an outer bulb enveloping said discharge tube;
a base engaging said envelope in a gas tight manner;
first and second internal main electrodes disposed respectively at each end of said discharge tube;
an external starting electrode proximate to at least an axial portion of said discharge tube;
a transformer disposed within the space enclosed by said envelope and said base having a primary winding and a secondary winding said secondary winding being connected to said first main electrode and said primary winding of the transformer being included in an electric circuit

which is in parallel with the discharge path between said main electrodes, and at least during starting of the lamp, said transformer windings being connected such that the peak voltage between said starting electrode and said



second main electrode is increased by means of said transformer and

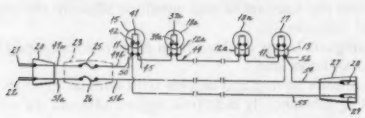
means for increasing frequency which includes said primary winding and said electric circuit.

4,223,248

FUSED LIGHT STRING SET

George K. K. Tong, 39 MacDonnell Rd., Hong Kong, Hong Kong

Filed Sep. 6, 1978, Ser. No. 939,974
Int. Cl.[2] H05B *37/03*
U.S. Cl. 315—185 S **19 Claims**



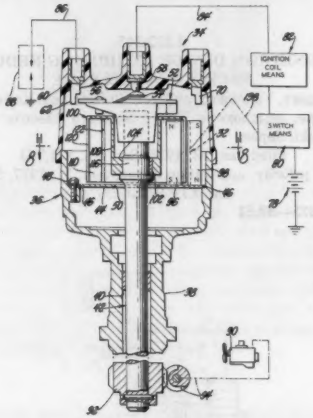
1. A light string set comprising a plurality of lamp sockets for receiving incandescent lamps, said sockets being carried by a flexible wiring string extending between a plug at one end of said conductor string and a receptacle at the other end of said conductor string, said receptacle being adapted for receiving a plug of a further light string set for tandem end-to-end connection of plural light string sets, said sockets including a first end socket physically located at one end of said conductor string proximate the plug end of said conductor string and a second end socket physically located at the other end of said conductor string proximate the receptacle end of said conductor string, and a plurality of sockets spaced at intervals between said first and second end sockets, said conductor string comprising first conductor means constituted by insulated wire segments interconnecting all of said sockets in a series circuit, said wire segments each being of wire guage substantially smaller than 20-gauge, said series circuit extending from a terminal of said first end socket to a terminal of said second socket, second conductor means connecting another terminal of said first end socket to a first terminal of said plug, third conductor means connecting another terminal of said second end socket to a second terminal of said plug, fourth conductor means connecting said another terminal of said first end socket to a first terminal of said receptacle, and fifth conductor means connecting said another terminal of said second end socket to a second terminal of said receptacle, and fuse means associated with each of said first and secod end sockets for providing current overload protection, said second, third, fourth and fifth conductor means comprising insulated wire of wire guage substantially larger than said first conductor means.

4,223,249

PULSE GENERATING MEANS

Philip V. Eshelman, Southfield, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Dec. 21, 1977, Ser. No. 851,488
Int. Cl.[2] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 M **26 Claims**



1. A pulse generator, comprising an axially extending magnetic wire, said magnetic wire having a medially disposed axially extending central portion of relatively low magnetic retentivity and coercivity and an axially extending outer shell of relatively high magnetic retentivity and coercivity, said shell having a magnetic field adapted for magnetizing said central portion in a first generally axial direction such that the magnetization of the central portion is reversible by application of a second magnetic field having an effective magnitude of at least a predetermined magnitude, said magnetic field of said shell also being operable to remagnetize said central portion in said first direction upon reduction of the effective magnitude of said second magnetic field below said predetermined magnitude, inductive coil means about said magnetic wire as to extend generally axially therealong and having at least first and second ends for electrical connection to associated electrical pulse signal receiving output means, first magnet means situated in relatively close proximity to and spaced from said magnetic wire and said inductive coil means, said first magnet means and said magnetic wire and inductive coil means being fixedly positioned relative to each other, said first magnet means being effective for creating said second magnetic field, relatively movable shutter means situated generally between said first magnet means and said magnetic wire and inductive coil means, said shutter means comprising aperture means, said aperture means when presented by said shutter means as to be generally between said first magnet means and said magnetic wire and inductive coil means permitting said second magnetic field to pass therethrough and be applied to said magnetic wire as to magnetize said central portion in a second direction opposite to said first direction thereby creating a resulting external magnetic field about said magnetic wire, said shutter means upon removing said aperture means from registry with said magnet means and said magnetic wire and inductive coil means being effective to reduce the effective magnitude of said second magnetic field as is applied to said magnetic wire to a

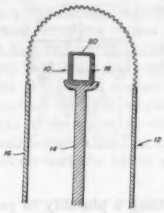
magnitude less than said predetermined magnitude thereby permitting said central portion to be remagnetized in said first direction and thereby causing said resulting external magnetic field to collapse, said inductive coil means being responsive to at least the said collapse of said resulting external magnetic field for creating said electrical pulse signal as electrically across said first and second ends, and second magnet means situated in relatively close proximity to and spaced from said magnetic wire and said inductive coil means, said second magnet means and said magnetic wire means being situated at a first side of said shutter means and said first magnet means being situated at a second side of said shutter means opposite to said first side, said second magnetic means producing a third magnetic field effective for influencing said magnetic wire and tending to cause said central portion of said magnetic wire to remagnetize in said first direction.

4,223,250

PROTECTIVE COATINGS FOR LIGHT SOURCES

Jerry M. Kramer, and Paul O. Haugsjaa, both of Acton, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 22, 1978, Ser. No. 972,534
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—248 **19 Claims**



1. A lamp for use in an electromagnetic discharge apparatus, said lamp comprising:

a lamp envelope made of a light transmitting substance and having an inner surface;

a fill material which emits light during electromagnetic discharge, said fill material being enclosed by said lamp envelope; and

a metallic coating disposed on the inner surface of said lamp envelope such that said coating is exposed to said fill material.

4,223,251

DEFLECTION CIRCUIT WITH RETRACE CONTROL

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1979, Ser. No. 42,593
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—370 **11 Claims**

1. A retrace controllable deflection circuit, comprising:

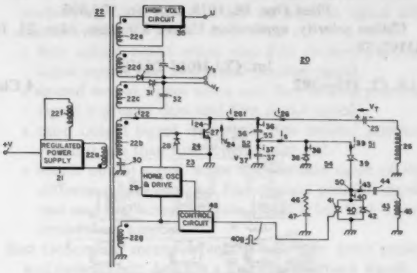
a deflection winding;

a source of trace voltage coupled to said deflection winding;

a trace switch coupled to said deflection winding for generating a trace deflection current in said deflection winding during a trace interval of a deflection cycle;

a retrace capacitance network coupled to said deflection winding for forming a resonant retrace circuit with said deflection winding during a retrace interval of each deflection cycle, wherein retrace deflection current flows in said network during said retrace interval; and

controllable shunting means coupled to said retrace capacitance network for bypassing a portion of said retrace



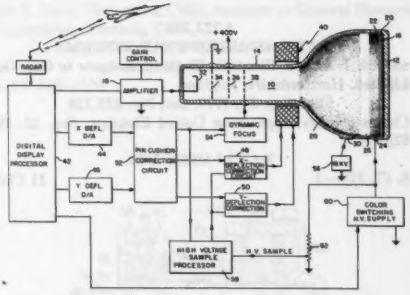
deflection current from at least a portion of said network, for controlling the retrace pulse width.

4,223,252

COLOR SWITCHING DISPLAY SYSTEM

Robert W. Doran, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 7, 1979, Ser. No. 36,930
Int. Cl.[3] H01J *29/80*
U.S. Cl. 315—375 **10 Claims**



1. A cathode ray tube display system comprising:

a cathode ray tube having a substantially flat face plate;

a plurality of colors of fluorescent material deposited thereon which are responsive to different velocities of the electron beam;

means for producing different colors from fluorescent material supported on said face plate comprising means for producing different high voltages between said fluorescent material on said face plate and a source of electrons for said electron beams;

means for deflecting said beam;

means for energizing said deflecting means with a waveform having a component derived from said high voltages and having a component which varies as a linear function of the desired position of said beam and which varies as a non-linear function of the magnitude of said deflection.

4,223,253

FOCUSING SYSTEM FOR COLOR TV CAMERA

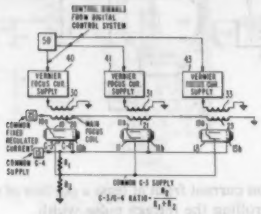
Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,805

Claims priority, application United Kingdom, Mar. 21, 1978, 11197/78

Int. Cl.³ H01J *29/58*

U.S. Cl. 315—382 **4 Claims**



1. A focusing system for color television camera having a plurality of image pickup tubes wherein associated with each tube is a yoke assembly, comprising:

a plurality of main focus coils with a main focus coil mounted on the yoke assembly about each pickup tube, said main focus coils being connected in series to a common regulated current supply, each of said main focus coils providing the bulk of the focus field for each pickup tube,

a plurality of separate vernier focus coils with a separate vernier focus coil mounted on the yoke assembly about each image pickup tube and means for applying to each vernier coil a separate low power, low voltage adjustable current whereby only a small amount of the total required focus field is provided via the vernier fields so that electronic focusing may be provided using a low voltage source without the stability problems.

4,223,254

POWER ASSISTED GEAR SYSTEMS

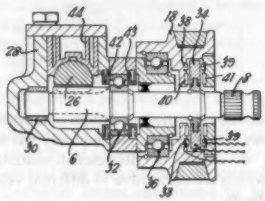
Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England

Filed Sep. 21, 1977, Ser. No. 835,228

Claims priority, application United Kingdom, Sep. 23, 1976, 39525/76

Int. Cl.² H02K *7/00*

U.S. Cl. 318—2 **11 Claims**



1. An apparatus comprising a rotatable shaft and means for providing a power assistance to rotate said shaft, said power assistance means including torque responsive means for moving said shaft axially to an extent which is a function of a torque applied to said shaft, drive means for providing power to assist the rotation of said shaft, said drive means including a reversible electric motor, electric contact means associated with said shaft for providing a flow of electric power to said drive means in response to a predetermined amount of axial movement of said shaft, said electric contact means including a first contact axially movable with said shaft and a left and right contact, said first contact being formed of two concentric annular surfaces on a disc fixedly connected with and coaxial with said shaft, said two annular surfaces being located on opposite sides of said disc, said left and right contacts being disposed on opposite sides of said first contact and connected with said reversible electric motor to effect rotation of said reversible electric motor in opposite directions upon contact with said first contact, and clutch means for transmitting power from said drive means to said shaft.

4,223,255

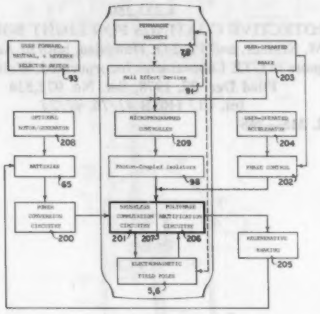
ELECTRIC WHEEL

Gary S. Goldman, 412 Livingston Ave., Placentia, Calif. 92670, and Allen W. Beishline, 5002 Van Buren St., Yorba Linda, Calif. 92868

Filed Oct. 28, 1977, Ser. No. 846,507

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—138 **34 Claims**



1. A motor having;

rotor means comprising a plurality of permanent magnets each having opposite polarity poles,

said permanent magnets arranged in a ring with the poles thereof aligned radially,

said permanent magnets arranged so that the poles thereof are disposed with circumferentially alternate polarity, and

stator means comprising a plurality of electromagnets arranged in a ring disposed adjacent said permanent magnets,

said electromagnets each having poles arranged to distribute two symmetrically-split magnetic fields that interact with the opposing permanent magnets to provide electromotive torque.

4,223,256

LIMIT SWITCH FOR D-C POSITIONING MOTOR

Helmut Espenschied, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,676

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801284

Int. Cl.² H02P *3/10*

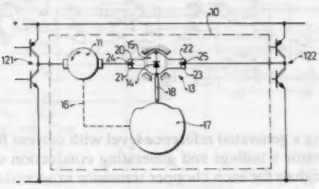
U.S. Cl. 318—282 **7 Claims**

1. Limit switch to control the operation of an electrical motor (**11**), the direction of rotation of which is controllable by an applied d-c voltage, comprising

a spring switch (**13**) and a diode (**14**) connected in the switching path of the spring switch and controlling passage or blocking of current flow to the motor in dependence on operation of the spring switch, said spring switch being positioned in the path of a positioned element (**17**), the limit position of which is to be controlled; wherein said spring switch (**13**) comprises a rocker ele-

ment (15) having a center or neutral position, and two respectively oppositely rocked operating positions;

two pairs of terminal contacts (20, 21; 22, 23) being secured to opposite sides of said rocker element (15) and deflecting in respectively opposite directions upon rocking of said rocker element, the contacts of the contact pairs facing each other and forming, respectively, first and second respective contact elements, corresponding first contact elements (20, 22) of said pairs being connected together and corresponding second contact elements (21, 23) of said pairs being connected together, the diode (14) being connected between the first and second connected contact elements;



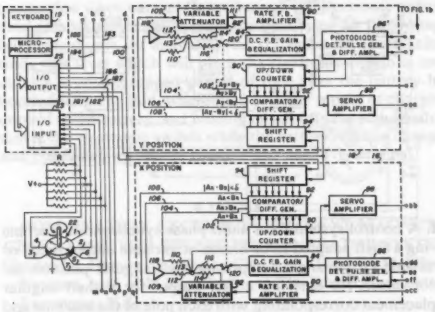
and spring contacts (24, 25) interposed between said opposed contact elements (20, 21; 22, 23) of each pair and connected serially with the motor and the motor current source of supply, the spring contacts (24, 25), in the quiescent or rest position of the rocker arm (15), connecting with both the first and second contact terminals (20, 21; 22, 23) of both said pairs and, upon deflection of said rocker element (15) into a rocked position, connecting with a first contact element of one pair, and a second contact element of the other, or vice versa, to place the diode connected between the first and second contacts of the pairs in circuit with the motor and the source of current supply.

4,223,257

ADAPTIVE SERVO CONTROL SYSTEM

Donald K. Miller, 1402 Lexington Way, Livermore, Calif. 94550

Filed Nov. 15, 1978, Ser. No. 960,943
Int. Cl.[2] G05B *11/18*
U.S. Cl. 318—594 **32 Claims**



1. An adaptive servo control system comprising:

first stage means for positioning a work piece relative to a work apparatus;

first drive means responsive to a first drive signal and operative to drive said first stage means in a first direction;

first position detector means for monitoring the position of said first stage means and for developing a first actual position signal commensurate therewith;

first input means for generating a first desired position signal corresponding to a position to which said first stage means is to be driven; and

first stage position control means including,

first comparator means for comparing said first actual position signal to said first desired position signal and for developing

a first output signal when said first desired position signal equals said first actual position signal,

a second output signal when said first desired position signal is greater than said first actual signal,

a third output signal when said first desired position signal is less than first actual signal and

a fourth output signal when the absolute value of the difference between said first desired position signal and said first actual position signal is less than a predetermined number,

first tachometer means driven by said first drive means and operative to develop a first rate feedback signal,

first servo amplifier means responsive to a first servo input signal and operative to develop said first drive signal,

first variable attenuator means responsive to said fourth output signal and operative to attenuate said first rate feedback signal,

first inverter means for inverting said third output signal,

first circuit node means for variously adding together said inverted third signal, said second output signal and said attenuated first rate feedback signal to develop said first servo input signal, and

means responsive to said first output signal and operative to couple a dc signal commensurate with said first position signal to said first node means for inclusion in said first servo input signal;

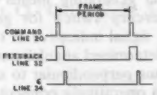
whereby in response to said first desired position signal said first stage means is driven at a first rate toward said desired position and is then driven at a second rate as it approaches the desired position.

4,223,258

DIGITALLY CONTROLLED SERVO SYSTEM

Garry T. Lacy, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Mar. 19, 1979, Ser. No. 21,381
Int. Cl.[3] G05B *11/28*
U.S. Cl. 318—599 **6 Claims**



1. A servo system wherein a servo motor is continuously controlled in response to a pulse width modulated digital command signal, comprising:

a servo motor having a variable output that is controlled in response to a variable amplitude error signal;

first means for providing a pulse width modulated digital command signal for controlling said variable output of said motor, wherein said digital command signal is provided at a predetermined frame rate in response to a frame pulse signal;

second means for sensing said variable output and for pro-

viding a variable amplitude feedback signal indicative of said variable output;

third means for converting said variable amplitude feedback signal to a proportional pulse width modulated digital feedback signal, wherein said digital feedback signal is provided at said predetermined frame rate and in synchronization with said digital command signal;

fourth means for summing said digital command signal with said digital feedback signal to provide a digital error signal; and

fifth means for converting said digital error signal to a continuous variable amplitude error signal for continuously controlling said variable output of said servo motor.

4,223,259

APPARATUS FOR SUPPORTING A BODY IN A DESIRED ANGULAR POSITION

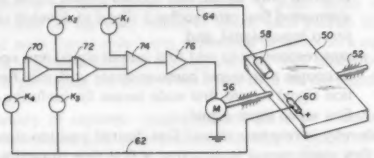
Klaus Ernsberger, Friedrichshafen, and Helmut Meier, Immenstaad, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 922,061

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731134

Int. Cl.[2] B64C *17/02*

U.S. Cl. 318—648 **5 Claims**



1. Apparatus for supporting a body in a desired angular position which comprises:

(a) a base;

(b) a carrier for said body mounted on said base;

(c) electrically operated drive means operatively interposed between said base and said carrier for angularly moving said carrier relative to said base about an axis extending horizontally in the normal operating position of said apparatus; and

(d) control means mounted on said carrier for controlling said drive means, said control means including

(1) first signal generating means for sensing the rate of angular movement of said carrier in a plane perpendicular to said axis and for generating a first signal indicative of the sensed rate,

(2) second signal generating means including position-responsive mercury switch for generating a second constant D.C. signal indicative of the absence or presence of a predetermined angular position of said switch means in a plane perpendicular to said axis, and

(3) circuit means operatively connected to said first and second signal generating means and to said drive means for transmitting to said drive means an electrical operating signal in response to said first and second signals and for thereby causing said switch means to be moved by said drive means into said predetermined angular position thereof.

4,223,260

STEPPER MOTOR DRIVE APPARATUS

Larry D. Beer, Romeo, and James M. Slicker, both of Detroit, Mich., assignors to The Valeron Corporation, Troy, Mich.

Filed Aug. 31, 1978, Ser. No. 938,431

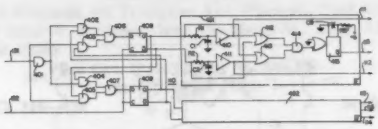
Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **8 Claims**

1. In a multiphase stepper motor under control of an external source of motor step and direction commands, a motor drive apparatus for converting the commands into stator winding drive currents, said apparatus comprising:

power drive means including a plurality of control transistors each associated with a different stator winding, a plurality of chopper transistors each associated with a different pair of the stator windings, the control and chopper transistors operative as connected to enable current flow through a stator winding only when its associated control and chopper transistors are enabled;

reference control means coupled to the external source and the power drive means, said reference control means including a reference level generator, and means for comprising a generated reference level with current flowing in the stator windings and generating conduction state control signals for each chopper transistor in accordance with comparison results; and



translator means coupled to the external source, the power drive means, and the reference control means, operative to generate a sequence of enabling signals, to couple the sequence to the control transistors in accordance with commands received from the external source, and said translator means being further operative to generate signals at predetermined times to disable the means for comparing such that the associated chopper transistor is disabled independently of the comparison result.

4,223,261

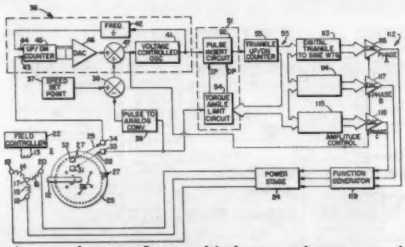
MULTI-PHASE SYNCHRONOUS MACHINE SYSTEM

Kevin E. White, Washington Township, Warren County, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 23, 1978, Ser. No. 936,016

Int. Cl.[2] H02P *7/44*

U.S. Cl. 318—721 **13 Claims**



1. A control system for a multi-phase synchronous machine having a shaft adapted to be driven at variable output speed or a variable torque angle comprising shaft angular position detector means for deriving a first output for a shaft angular displacement corresponding with each pole of the machine and for deriving a second output for a predetermined shaft angular displacement within each pole, means responsive to the second detector for deriving a variable frequency output determined by the frequency of the second output, means for selectively inserting and deleting one cycle from the variable frequency output to derive a variable phase output, means responsive to the variable phase output for deriving an output signal having a frequency that is a sub-multiple of the variable frequency output and a phase determined by the phase of the variable phase output, means for comparing the phase of the first output

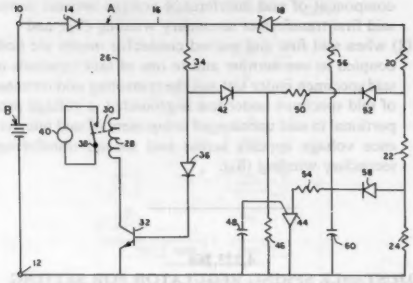
and the output signal for controlling the means for inserting and deleting, and means for driving each phase of the machine in response to the output signal.

4,223,262

MEANS FOR CONTROLLING BATTERY CHARGERS

Gray C. Ballman, 30 Portland Dr., St. Louis, Mo. 63131

Filed Jun. 12, 1978, Ser. No. 914,408
Int. Cl.³ H02J 7/04
U.S. Cl. 320—40 **2 Claims**



1. A voltage following control device comprising a positive terminal, a negative terminal, a relay including a coil and a pair of normally open contacts, a transistor operatively connected to the positive terminal and the negative terminal in series with the relay coil and adapted for going into conduction when a battery is connected across the positive terminal and negative terminal, a voltage following circuit including a Zener diode and first, second and third resistors in series, an electronic switch including a first electrode and a second electrode and adapted for going into conduction when the voltage at the second electrode is more positive than the voltage at the first electrode with respect to the negative terminal, the first electrode being connected to the voltage following circuit between the first and second resistors through a fourth registor and also being connected to the negative terminal through a fifth resistor and the second electrode being connected to the voltage following circuit between the second and third resistor, biasing means operatively connected to the transistor and the electronic switch and adpated for biasing the transistor out of conduction when current flows through the electronic switch, time responsive means operatively connected to the voltage following circuit for increasing the voltage at the second electrode to a level which will place the electronic switch in conduction a predetermined period of time after the battery has become fully charged, whereby to stop the supply of charging current to the battery, and holding means for retaining conduction in the electronic switch while the battery remains charged and connected across the positive and negative terminal.

4,223,263

COMBINATION EXCITER/PERMANENT MAGNET GENERATOR FOR BRUSHLESS GENERATOR SYSTEM

Charles M. Hansen, Jr., Ocean City, and Alfred W. Wohlberg, Neptune, both of N.J., assignors to The Bendix Corporation, Eatontown, N.J.

Filed Sep. 1, 1978, Ser. No. 939,149
Int. Cl.³ H02P 9/30
U.S. Cl. 322—47 **9 Claims**

2. A generator system having self build-up characteristics, comprising:

a housing;

a rotating member journaled in the housing;

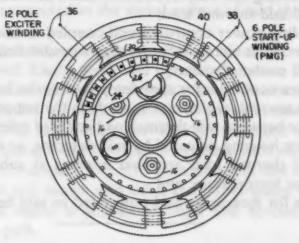
a main stator and an exciter field secured within the housing;

a rotating field magnetically coupled to the main stator and secured to the rotating member so as to rotate therewith;

an exciter armature magnetically coupled to the exciter field and secured to the rotating member so as to rotate therewith, and including a lamination assembly, a non-magnetic disc arranged with the lamination assembly, a plurality of permanent magnets carried by the disc, and interacting with the exciter field for providing a magnetic circuit, and a magnetic ring arranged with the disc for completing the magnetic circuit;

means for energizing the exciter field so that a voltage is created in the exciter armature upon rotation of the rotating member;

the rotating field being responsive to the voltage created in



the exciter armature for creating a voltage in the main stator;

a plurality of exciter field poles;

the exciter field including a winding wound in alternate directions around the field poles;

a permanent magnet generator including a stator having a winding wound in alternate directions around pairs of the exciter field poles; and

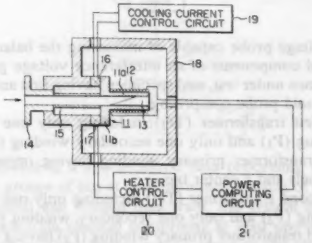
the permanent magnet generator stator winding providing a start-up winding which is non-interactive with the exciter field winding, whereby a residual voltage is developed for self build-up of the generator system output voltage.

4,223,264

RADIO WAVE POWER MEASURING APPARATUS

Kyohei Yamamura; Takemi Inoue, both of Higashimurayama; Toshio Nemoto, Tokyo; Hidetoshi Miyao, Atsugi; Yukihiro Tsumura, Zama; Hiromichi Toda, Atsugi, and Itsuo Sugiura, Machida, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology and Anritsudenki Kabushikigaisha, both of, Japan

Filed Dec. 12, 1978, Ser. No. 968,816
Claims priority, application Japan, Dec. 15, 1977, 52/149918
Int. Cl.² G01R 21/04, 5/22
U.S. Cl. 324—95 **20 Claims**



1. A thermal balancing microcalorimeter comprising:

a reference temperature housing;

a waveguide member having a portion extending through an opening of said housing to the inside space thereof;

a thermal load having a hollow elongated portion connected

in series to said extending portion of said waveguide member;

heater means adapted for heating said thermal load;

a wave absorber disposed inside the elongated portion of said thermal load and adapted for absoring a radio wave supplied thereto via said waveguide member;

a thermoelectric cooling element connected at one side to a first portion of said housing and at the other side to a first portion of said thermal load and adapted for cooling said thermal load;

a detector having a thermoelectric sensor element connected at one side to a second portion of said housing and at the other side to a second portion of said thermal load for detecting the temperature difference between said housing and said thermal load;

a cooling-power control circuit coupled to said thermoelectric cooler elements for feeding a predetermined power to said cooler elements;

a heater controller for applying power to the heater means in the amount, which corresponds to the temperature difference between said thermal load and said reference temperature housing detected by said detector, so as to maintain said thermal load and said housing at substantially the same temperature; and

means for measuring said power fed to said heating means.

4,223,265

HIGH-IMPEDANCE AND WIDE-BAND VOLTAGE PROBE FOR THE SELECTIVE MEASUREMENT OF INTERFERENCE VOLTAGES

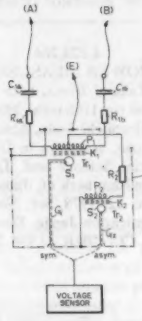
Eugene Simmen, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 770,078, Feb. 18, 1977, abandoned. This application Aug. 15, 1978, Ser. No. 933,652

Claims priority, application Switzerland, Mar. 15, 1976, 3166/76

Int. Cl.[2] G01R *1/20, 15/00*

U.S. Cl. 324—127 **10 Claims**



1. A voltage probe capable of measuring the balanced and unbalanced components of an interference voltage generated by a specimen under test, said specimen having first and second terminals, said probe comprising:

(A) a first transformer (Tr_1) including only one primary winding (P_1) and only one secondary winding (S_1), said first transformer primary winding having opposite end terminals and a center tap;

(B) a second transformer (Tr_2) including only one primary winding (P_2) and only one secondary winding (S_2), said second transformer primary winding (P_2) having opposite end terminals, one of said end terminals of said second transformer primary winding (P_2) being connected to said first transformer primary winding (P_1) center tap, the remaining said end terminal of said second transformer primary winding (P_2) being coupled to ground;

(C) first connector means adapted to couple, at the option of the operator of said probe, one of said end terminals of said first transformer primary winding (P_1) to either of said first and second terminals of said specimen under test; and

(D) second connector means adapted to couple, at the option of the operator of said probe, the remaining of said end terminals of said first transformer primary winding (P_1) to either of said first and second terminals of said specimen under test, whereby:

(1) when said first and second connector means are each coupled to respective opposite terminals of said specimen under test, a voltage proportional to the balanced component of said interference voltage appears across said first transformer secondary winding (S_1); and

(2) when said first and second connector means are both coupled to one another and to one of said terminals of said specimen under test and the remaining said terminal of said specimen under test is grounded, a voltage proportional to said unbalanced component of said interference voltage appears across said second transformer secondary winding (S_2).

4,223,266

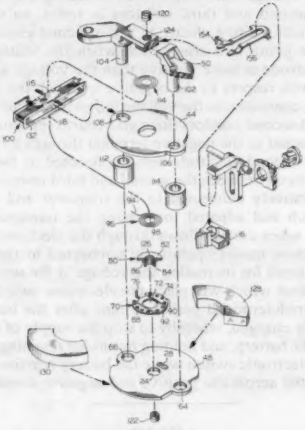
ADJUSTABLE SPRING REGULATOR FOR SETTING INDICATING INSTRUMENT POINTER

Edward F. Scannell, Saugus, Mass., assignor to General Electric Company, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 948,174

Int. Cl.[2] G01R *1/00*

U.S. Cl. 324—154 R **10 Claims**



1. An instrument indicator adjustment mechanism comprising:

indicator means positioned by at least one torsion spring,

an annular leaf spring mounted between a supporting plate and an assembly eyelet for said annular spring,

means for attaching one of said at least one torsion spring to said annular spring,

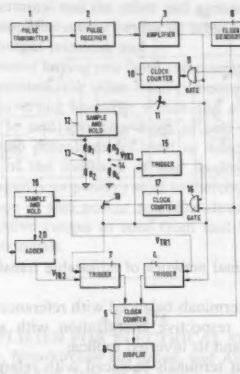
said one torsion spring being attached at one end to said attaching means of said annular spring and at the other end to a support for said instrument indicator means, and

said annular spring having peripheral holes, said holes being aligned with an access window in the support plate for providing means for adjustment through the window of the angular deposition of said annular spring about its center.

4,223,267
CIRCUIT ARRANGEMENT FOR MEASURING PULSE WIDTHS

Wilfried Sartorius, Steinen, and Don J. R. Stock, Schopfheim-Langenau, both of Fed. Rep. of Germany, assignors to Endress & Hauser GmbH & Co., Maulburg, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,385
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729422
Int. Cl.² G04F 8/00
U.S. Cl. 368—118 8 Claims

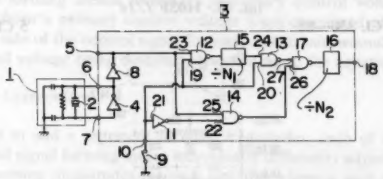


1. Pulse width measuring apparatus for measuring the widths of pulses in a pulse train comprising a threshold-level trigger responsive to pulses having rising and falling edges for generating a first output signal each time the rising edge of a pulse rises above a first threshold voltage, means responsive to said pulses for generating a second output signal each time the falling edge of a pulse falls below a second threshold voltage, time-measuring means for measuring the time duration between said first and second output signals, first means for sampling and holding the value of the amplitude of each pulse and a voltage divider connected to the output of the sample and hold means, the tapping of which establishes the threshold voltage of the threshold-level trigger.

4,223,268
FREQUENCY DIVIDING CIRCUIT OF VARIABLE FREQUENCY DIVIDING RATIO TYPE

Akio Shimizu, Tone, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 890,947
Claims priority, application Japan, Apr. 18, 1977, 52-48822
Int. Cl.² H03K 21/36, 21/06
U.S. Cl. 328—48 7 Claims



1. A variable frequency divider circuit for dividing an input signal having a selected frequency, comprising:

a first signal-dividing path that includes, in series connection, a first signal-controlling gate having a signal input adapted for connection to an input signal source, a first frequency divider having its signal input connected to a signal output of said first gate for dividing a signal at a selected ratio, a second signal-controlling gate having a signal input connected to the output of said first frequency divider circuit, a third signal-controlling gate having a first input connected to a signal output of said second gate, and a second frequency divider having its input connected to a signal output of said third gate for dividing a signal at a selected ratio;

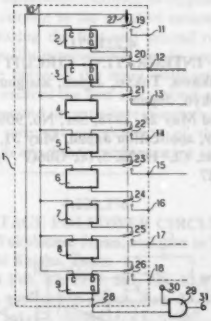
a second signal-dividing path that includes, in series connection, a fourth signal-controlling gate having its signal input adapted for connection to the input signal source, a second input of said third gate connected to the output of said fourth gate, and said second frequency divider having its input connected to the signal output of said third gate; and

control switch means coupled to control inputs of said first, second, and fourth gates and operable between first and second states, said control switch means, when in said first state, effective to inhibit said fourth gate and enable said first, second, and third gates wherein the input signal is applied through said first signal-dividing path and, when in said second state, effective to inhibit said first and second gates and enable said third and fourth gates wherein the input signal is applied through said second signal-dividing path.

4,223,269
DEVICE FOR INSERTING SEVERAL BITS IN A RHYTHMED DIGITAL TRAIN

Jean-Claude Barigot, Brie Comte Robert, and Jean-Jacques Beau, Antony, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Continuation of Ser. No. 662,204, Feb. 27, 1976, abandoned.
This application Sep. 1, 1977, Ser. No. 829,982
Claims priority, application France, Mar. 4, 1975, 75 06697
Int. Cl.² G06F 7/00; G11C 19/00; H03K 5/18
U.S. Cl. 328—63 7 Claims



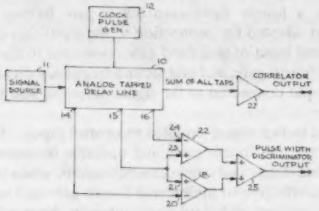
1. A device in a synchronized data processing system for inserting groups of bits at predetermined instants of time into a synchronized and framed data train, the system including a binary data train channel comprising at least one data frame, and including clock pulses and an input to the channel, said device comprising: a closed loop shift register with a plurality of parallel write-in inputs receiving said groups; a shift input receiving said clock pulses and a serial output delivering bits to the input of said data train channel, the parallel write-in operation being dependent on said predetermined instants of time.

4,223,270

MULTIPLEXED CCD PULSE WIDTH DISCRIMINATOR

Hans-Peter Schmid, Rancho Cucamonga, and Richard S. Schlunt, Los Angeles, both of Calif., assignors to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Jul. 20, 1978, Ser. No. 926,582
Int. Cl.³ H03K 5/22
U.S. Cl. 328—112 18 Claims



1. A pulse width discriminator comprising:

an analog delay line, said delay line having a predetermined number of taps corresponding to a predetermined delay between said taps;

a signal source for generating a signal including pulses of equal amplitude but different widths, said signal source being coupled to said delay line;

a clock pulse generator coupled to said delay line for periodically sampling the signal impressed on said delay line; and

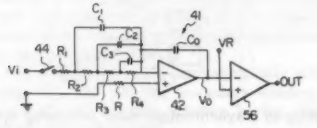
means for weighting and adding the sampled signals obtained from selected ones of said taps on said delay line in accordance with a predetermined order to provide a pulse width discriminator output containing different amplitude signals corresponding to input pulses of different widths.

4,223,271

INTEGRATING CIRCUIT

Masamichi Furukawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,110
Claims priority, application Japan, May 31, 1977, 52-63707
Int. Cl.² H03K 5/00; G06G 7/18
U.S. Cl. 328—127 7 Claims



1. An integrating circuit comprising:

an operational amplifier having a first input and an output;

an integrating capacitor connected between the first input and the output;

a plurality of resistors connected in series to the first input; and

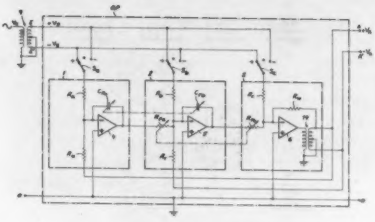
a plurality of capacitors connected between the first input and junctions of the resistors respectively.

4,223,272

FOUR-TERMINAL NETWORK OF ADJUSTABLE TRANSFER FUNCTION

Karl H. Feistel, Nürnberg-Röthenbach, Fed. Rep. of Germany, assignor to Wandel & Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,665
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747857
Int. Cl.² H03F 1/34
U.S. Cl. 330—51 8 Claims



1. A four-terminal network of adjustable transfer function, comprising:

a pair of input terminals balanced with reference to a neutral terminal for respective energization with an incoming signal wave and its inverted replica;

a pair of output terminals balanced with reference to said neutral terminal;

a plurality of cascaded network components between said input and output terminals including a first adder, a second adder and a third adder each having input means provided with a supply connection and further provided with a feedback connection originating at one of said output terminals, each of said supply connections including a weighting resistance determining a respective coefficient in a numerator of a biquadratic equation representing said transfer function, each of said feedback connections including a weighting resistance determining a respective coefficient in a denominator of said biquadratic equation; and

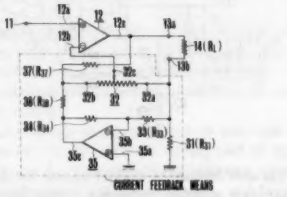
first, second and third switch means selectively operable to extend the supply connections of said first, second and third adders to either or neither of said input terminals.

4,223,273

POWER AMPLIFYING DEVICE FOR DRIVING LOUDSPEAKERS

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 3, 1978, Ser. No. 957,211
Claims priority, application Japan, Nov. 4, 1977, 52-132373
Int. Cl.² H03F 1/34
U.S. Cl. 330—85 5 Claims



1. A power amplifying device comprising:

power amplifier means having a noninverting input, an inverting input and an output;

a first output terminal connected to said output of said power amplifier means;

a second output terminal;

said first and second output terminals being connected to a loudspeaker through a line;

means for applying an input signal to said noninverting input of said power amplifier means; and

current feedback means connected between said second output terminal and said inverting input of said power amplifier means, said current feedback means comprising

a first resistor having one end connected to said second output terminal and the other end grounded,

inverting amplifier means having an input connected to said second output terminal, and

a potentiometer having one fixed end coupled to said second output terminal, the other fixed end coupled to an output of said inverting amplifier means and a slidable contact coupled to said inverting input of said power amplifier means, said potentiometer used to selectively cause the polarity of the feedback of said feedback means to be either negative or positive so as to thereby vary the output impedance of said power amplifier device over positive and negative ranges as seen from said first and second output terminals.

4,223,274
AMPLIFIER FOR ELECTRICAL SIGNALS

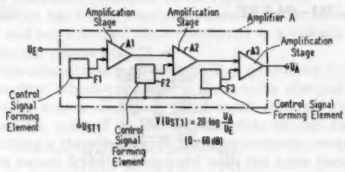
Bodo Paulke, Neunkirchen am Brand, and Alfred Walz, Burgthann, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,030

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803204

Int. Cl.² H03G *3/00*

U.S. Cl. 330—133 **8 Claims**



1. An amplifier for electrical signals, comprising: a plurality of series-connected amplification stages of which each has at least one voltage-controlled amplifier element having means for setting its control characteristic by a control voltage; a control signal forming means for at least each of the amplifier elements of each amplification stage which have different control characteristics compared to one another; said control signal forming means forming a secondary control voltage U_{ST2} from a primary control voltage U_{ST1} connected at an input side of the control signal forming means, said secondary control voltage being determined according to the equation

$$U_{ST2}=mU_{ST1}+n$$

where m and n represent forming magnitudes; each of said control signal forming means individually differently adjusting the forming magnitudes for each amplifier element such that differences in said different control characteristics can be compensated for by adjusting to a commonly prescribable preferred characteristic, the control signal forming means having a voltage divider means for determining the forming magnitude m and means for superimposing a DC voltage with a product signal of $m \cdot U_{ST1}$ in order to prescribe the forming magnitude n.

4,223,275
LINEAR AMPLIFIERS

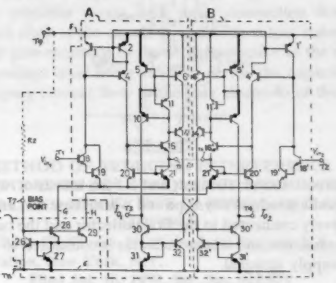
Carl S. den Brinker, Oakley, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 685,590, May 12, 1976, abandoned.

This application Oct. 6, 1978, Ser. No. 949,313

Int. Cl.² H03F *3/45*

U.S. Cl. 330—257 **30 Claims**



1. An amplifier having first and second input terminals for receiving first and second input voltages respectively;

first and second output terminals for delivering first and second output currents respectively;

means for delivering to first and second current summing nodes equal constant currents, the delivering means also being responsive to the first and second input voltages to produce on the first and second current summing nodes voltages which are the same linear function of the respective input voltages;

resistive means connected between the first and second current summing nodes so as to pass a cross current, which is proportional to the difference between the voltages on the first and second current summing nodes and inversely proportional to the resistance of the resistive means;

means coupled to the first and second current summing nodes for producing first and second intermediate currents, each intermediate current proportional to the constant current additively modified in opposite sense to the other by the current in the resistive means;

means for producing the first and second output currents, which are equally proportional but in opposite senses to the difference between the input voltages, by additively combining at each of the first and second output terminals the first and second intermediate currents to cancel out at each output terminal components of the intermediate currents which are due to said constant currents.

4,223,276
VOLTAGE FOLLOWER CIRCUIT

Katsumi Nagano, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 22, 1979, Ser. No. 13,971

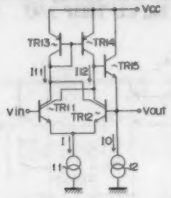
Claims priority, application Japan, Feb. 23, 1978, 53-20276

Int. Cl.² H03F *3/45, 3/04*

U.S. Cl. 330—257 **6 Claims**

1. A voltage follower circuit which comprises a current source including first and second transistors of one conductivity type; a third transistor which has the opposite conductivity type to said first and second transistors and whose first collector is connected to the collector of the first transistor, whose second collector has a smaller area than said first collector, and whose base is supplied with an input signal; a fourth transistor which has the opposite conductivity type and whose first collector is connected to the collector of the second transistor and also to the second collector of the third transistor, whose

second collector has a smaller area than said first collector and is connected to the first collector of the third transistor and whose emitter is connected to the emitter of the third transistor and also to a first power supply terminal through a first constant current source element; and a fifth transistor which has the opposite conductivity type and whose base and emitter are respectively connected to the first collector and the base of the fourth transistor, and whose collector is connected to a second power supply terminal.



4,223,277

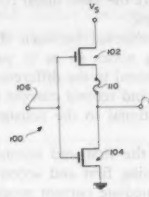
ELECTRICALLY ALTERABLE FIELD EFFECT TRANSISTOR AMPLIFIER CONFIGURATION

David L. Taylor, and Stephen A. Harris, both of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 861,331, Dec. 16, 1977, Pat. No. 4,153,883. This application Dec. 27, 1978, Ser. No. 973,668

Int. Cl.[2] H03F *3/18;* H01L *25/00*

U.S. Cl. 330—264 **10 Claims**



1. In an active pull-up field effect transistor amplifier having a P-channel device and an N-channel device connected in series between a pair of voltage supply terminals, their gates forming the input of the amplifier and their drains forming the output of the amplifier, the improvement comprising:

a fusible means of substantially neglegable resistance only in the drain circuit of said P-channel device for irreversibly converting said amplifier from an active pull-up to an open drain configuration upon being electrically altered.

4,223,278

HIGH ENERGY, RAPID DISCHARGE DEVICE FOR THE EXCITATION OF GAS DISCHARGE LASERS

Steven D. Colson, 1025 Notch Rd., Cheshire, Conn. 06410; Paul C. Engelking, 1760 Athens NW 1, Boulder, Colo. 80302, and Robert E. Turner, 169 Norton St., New Haven, Conn. 06511

Filed Jan. 31, 1977, Ser. No. 764,479

Int. Cl.[2] H01S *3/09*

U.S. Cl. 331—94.5 PE **9 Claims**

1. A transverse excitation, pulsed discharge gas laser comprising,

a gas discharge laser tube formed from two substantially parallel electrodes extending the full length of the tube,

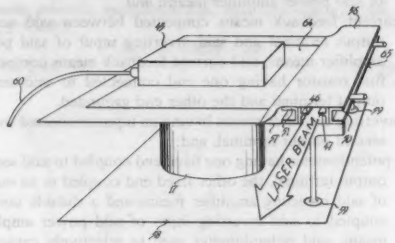
means for holding said electrodes in place comprising rigid insulating spacers forming the longer sides of said tube,

rigid insulators of high optical transmittance forming the ends of said tube,

a lumped, high voltage capacitor for intermediate storage of electrical energy,

means for connecting said capacitor and laser tube comprising a single electrical transmission line,

a high voltage switch for making controlled, intermittent



electrical contact between the capacitor and the transmission line,

a high voltage power supply for charging said intermediate storage capacitor and

a gas pumping and supply system for maintaining the proper gas-fill in the laser tube.

4,223,279

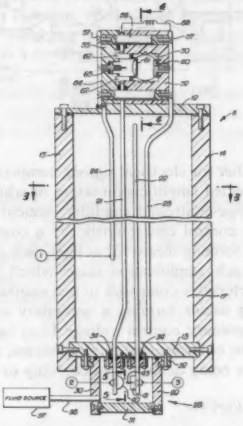
PULSED ELECTRIC DISCHARGE LASER UTILIZING WATER DIELECTRIC BLUMLEIN TRANSMISSION LINE

Robert S. Bradford, Jr., Los Angeles; Leonard W. Braverman, Santa Monica, and Jeffrey I. Levatter, San Clemente, all of Calif., assignors to Mathematical Sciences Northwest, Inc., Bellevue, Wash.

Filed Jul. 18, 1977, Ser. No. 816,696

Int. Cl.[2] H01S *3/097*

U.S. Cl. 331—94.5 PE **10 Claims**



1. In a pulsed electric discnarge gas laser having an elongate gas lasing chamber with elongate spaced cathode and anode along opposite sides of the chamber, the improvement comprising in combination:

a container of liquid dielectric;

first, second, and third metal plates positioned in said container of liquid dielectric in a parallel spaced apart relationship with other, with said second plate between said first and third plates, whereby said plates in conjunction with said liquid dielectric form a flat plate folded Blumlein

transmission line and wherein said first and third plates project through a wall of said container;

means for connecting said first plate to said cathode and said third plate to said anode;

a low inductance gas switch connected between said second plate and one of said first and third plates for switching a high current voltage pulse onto said flat plate folded Blumlein transmission line;

an inductance connected between said first and third plates; and

means for connecting an external pulse power supply to said second plate and one of said first and third plates.

4,223,280

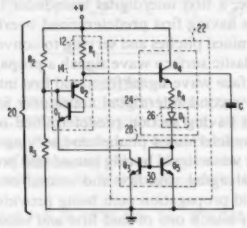
RELAXATION OSCILLATOR INCLUDING AN SCR AND HAVING SWITCH MEANS FOR INTERRUPTING CURRENT FLOW THERETHROUGH

Adel A. A. Ahmed, Clinton Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,846

Int. Cl.³ H03K *3/82, 3/352*

U.S. Cl. 331—111 **13 Claims**



1. In a relaxation oscillator of the type wherein

a capacitor has a first plate connected to a reference potential and has a second plate connected to a voltage rail by a current source and;

the main conduction path of an SCR is connected across the capacitor, which capacitor is recurrently charged by the current source and then discharged through the SCR upon the voltage at the second plate of the capacitor reaching a threshold level, the improvement comprising:

switch means serially connected with the main conduction path of the SCR for interrupting current flow therethrough responsive to the voltage at the second plate of the capacitor being discharged to a predetermined level during each oscillation cycle.

4,223,281

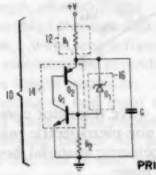
SCR RELAXATION OSCILLATOR WITH CURRENT AMPLIFIER IN ITS GATE CIRCUIT

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,847

Int. Cl.³ H03K *3/82, 3/352*

U.S. Cl. 331—111 **10 Claims**



PRIOR ART

1. In a relaxation oscillator of the type wherein a capacitor has a first plate connected to a reference voltage rail and has a second plate connected to a supply voltage rail through a current source, and wherein the main conduction path of an SCR is connected across the capacitor, which capacitor is recurrently charged by the current source and then discharged through the SCR when its gate electrode is forward biased responsive to the voltage across the capacitor reaching a threshold level, the improvement comprising:

current amplifier means with input connection from the second plate of the capacitor and with output connection to the gate electrode of the SCR responsive to the threshold voltage level being reached across the capacitor for supplying current flow to the gate electrode of the SCR.

4,223,282

METHOD OF REDUCING INTERFERENCE COMPONENTS IN A FREQUENCY MODULATED SIGNAL AND DEVICE FOR CARRYING OUT SAID METHOD

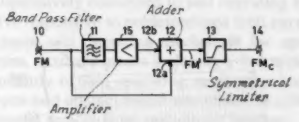
Eeltje de Boer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,971

Claims priority, application Netherlands, May 16, 1978, 7805232

Int. Cl.² H03C *3/08;* **H04B** *1/12, 15/00*

U.S. Cl. 332—10 **14 Claims**



1. A method of reducing interference components in a frequency-modulated signal, comprising a carrier signal being frequency-modulated by at least one modulating signal of a fixed frequency, wherein the carrier signal is pulse-width modulated by the first-order lower side-band component which is contained in the frequency-modulated signal as a result of the modulating signal.

4,223,283

TWO INTO THREE PORT PHASE SHIFTING POWER DIVIDER

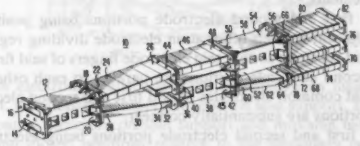
Kwok K. Chan, Kirkland, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,157

Claims priority, application Canada, Nov. 16, 1978, 316355

Int. Cl.² H01P *5/18, 5/20*

U.S. Cl. 333—109 **10 Claims**



8. A three-way power divider comprising:

first, second and third power divider output terminals;

a first coupler having a first coupling ratio and having two inputs for receiving two signals, respectively, whose power is to be divided, and producing at each of first and second output terminals, a given fractional part of both input signals, the fractional part of each signal at the first

output terminal being phase displaced from the second fractional part of the same signal at the second output terminal;

a second coupler having a second coupling ratio, different from said first coupling ratio, and having two inputs, connected at one of its input to the first of said output terminals and at its other input to a terminating impedance, said second coupler having first and second output terminals, the first connected to the first power divider output terminal; and

a third coupler having two inputs, one connected to the second output terminal of the second coupler, and the other coupled to the second output terminal of the first coupler, said third coupler having first and second output terminals connected to the second and third power divider output terminals, respectively.

4,223,284

ACOUSTIC SURFACE WAVE DEVICE

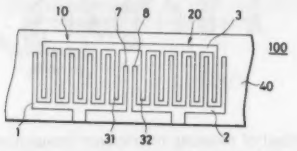
Atsushi Inoue; Hiromichi Yamada, and Kenji Suzuki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Oct. 30, 1978, Ser. No. 955,638

Claims priority, application Japan, Nov. 7, 1977, 52-149763[U]; Nov. 7, 1977, 52-149764[U]; Nov. 7, 1977, 52-149765[U]

Int. Cl.[2] H03H *9/26, 9/30, 9/04;* **H01L** *41/10*

U.S. Cl. 333—150 **10 Claims**



1. An acoustic surface wave device, comprising:

a piezoelectric material substrate adapted for supporting propagating acoustic surface wave energy;

at least one electromechanical transducer means for converting an electrical signal into an acoustical wave and vice versa, said transducer means being coupled to a surface of said piezoelectric material substrate at a transducer region thereof, said transducer means including an interdigital electrode assembly including first and second electrode portions, each of said electrode portions including,

first and second common electrodes, and

first and second groups of electrode fingers commonly connected respectively to said common electrodes at one end thereof and extending toward the other said common electrode to form overlapping electrode lengths which define an envelope, each of said electrode fingers being of the split type having two adjacent parallel split electrode elements;

said first and second electrode portions being positioned adjacent to each other at an electrode dividing region of said substrate so that said electrode fingers of said first and second electrode portions are parallel to each other and said common electrodes of said first and second electrode portions are substantially colinear;

said first and second electrode portions being electrically connected in series by connecting a common electrode of said first electrode portion with a common electrode of said second electrode portion;

the split electrode element of at least one of said first and second electrode portions directly adjacent to said electrode dividing region forming an end electrode element of a length less than the length of the other adjacent electrode fingers of said first and second electrode portions which form said envelope.

4,223,285

ELASTIC SURFACE WAVE FILTER

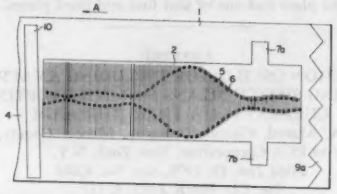
Katashi Hazama; Jun Yamada, both of Yokohama, and Yoshihiko Noro, Kamakura, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 6, 1977, Ser. No. 857,908

Claims priority, application Japan, Dec. 8, 1976, 51-146504

Int. Cl.[2] H03H *9/04, 9/26, 9/32*

U.S. Cl. 333—194 **10 Claims**



1. An elastic surface wave filter comprising: a piezoelectric substrate plate; a first interdigital transducer including interleaved fingers having first predetermined overlap lengths and first predetermined pitches and serving to convert an electrical signal to an elastic surface wave signal; a propagation path for the elastic surface wave signal from said first interdigital transducer; and a second interdigital transducer including interleaved fingers having second predetermined overlap lengths and second predetermined pitches and serving to convert the elastic surface wave signal having passed said propagation path to an electrical signal, said first and second interdigital transducers and said propagation path being provided on said substrate plate; in which one of said first and second interdigital transducers has a maximum overlap length at a position thereon farther from the other interdigital transducer than the center thereof is, and the overlap lengths and the pitches in said one interdigital transducer vary in an asymmetrical manner with respect to said maximum overlap length position in directions towards and away from the other interdigital transducer.

4,223,286

SURFACE ACOUSTIC WAVE RESONATOR

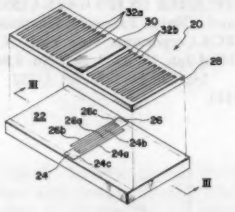
Shusuke Ono, Takatsuki; Kenzo Ohji, Hirakata; Osamu Yamazaki, Suita, and Kiyotaka Wasa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 5, 1978, Ser. No. 940,510

Claims priority, application Japan, Sep. 5, 1977, 52/107018

Int. Cl.[2] H03H *9/20, 9/32;* **H01L** *41/10, 41/18*

U.S. Cl. 333—195 **8 Claims**



1. A surface acoustic wave resonator comprising:

a base plate made of non-piezoelectric material;

a first layer of piezoelectric material bonded on one flat surface of the base plate;

a pair of elongated electrodes provided on a surface of said first layer which is opposite to the surface facing said base

plate, said elongated electrodes being positioned parallel to each other;

a plurality of strips of piezoelectric material supported on the base plate, said strips extending parallel to each other and also to the elongated electrodes, each two adjacent strips being spaced a predetermined distance from each other, said strips satisfying the equation:

$$(1-\frac{A}{L})\frac{1}{V_1}\frac{dV_1}{dT}+\frac{A}{L}\frac{1}{V_2}\frac{dV_2}{dT}=\beta$$

wherein A is the width of each strip, L is the pitch of each two adjacent strips, V_1 is the velocity of a predetermined surface acoustic wave propagated over the base plate where the base plate is provided with no strips, V_2 is the velocity of the predetermined surface acoustic wave propagated over the base plate where the base plate is provided with strips, T is the absolute temperature, and β is the thermal expansion coefficient of the base plate, for giving to said resonator a zero temperature coefficient ϕ of resonance frequency which is according to the equation:

$$\phi=(1-\frac{A}{L})\frac{1}{V_1}\frac{dV_1}{dT}+\frac{A}{L}\frac{1}{V_2}\frac{dV_2}{dT}-\beta$$

4,223,287

ELECTRICAL FILTER EMPLOYING TRANSVERSE ELECTROMAGNETIC MODE COAXIAL RESONATORS

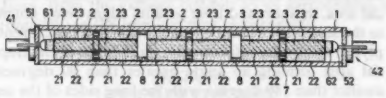
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa; Sadahiro Tamura, both of Kyoto, and Haruo Matsumoto, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 9, 1978, Ser. No. 876,245

Claims priority, application Japan, Feb. 14, 1977, 52-15203; Feb. 14, 1977, 52-16815[U]; Feb. 14, 1977, 52-16816[U]; Jul. 5, 1977, 52-80826; Jan. 5, 1978, 53-327[U]; Jan. 19, 1978, 53-5470; Jan. 19, 1978, 53-5471; Jan. 19, 1978, 53-5472; Jan. 19, 1978, 53-5473

Int. Cl.³ H01P *1/205, 7/04*

U.S. Cl. 333—206 **26 Claims**



1. An electrical filter, comprising:

at least one ¼ wave length transverse electromagnetic mode coaxial resonator, said resonator including an inner conductor, an outer conductor surrounding said inner conductor and a dielectric member disposed between said inner conductor and said outer conductor;

an electrically conductive casing means surrounding said resonator for housing said at least one ¼ wave length transverse electromagnetic mode coaxial resonator;

input means provided through said casing and coupled to said at least one ¼ wave length transverse electromagnetic mode coaxial resonator for providing an input terminal to the ¼ wave length resonator; and

output means provided through said casing and coupled to said at least one ¼ wave length transverse electromagnetic mode coaxial resonator for providing an output terminal for the ¼ wave length resonator;

wherein the coupling of said input means and said output means to the ¼ wave length resonator includes,

capacitive coupling means for providing a capacitive coupling to one end of said ¼ wave length transverse electromagnetic mode coaxial resonator; and

inductive coupling means for providing an inductive coupling to the other end of said ¼ wave length transverse electromagnetic mode coaxial resonator.

4,223,288

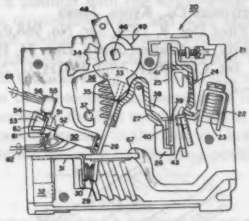
MANUALLY OPERABLE AND SHUNT CONTROLLABLE CIRCUIT BREAKER

Kent P. Stiner, Chadds Ford, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 15, 1979, Ser. No. 3,135

Int. Cl.³ H01H *83/00*

U.S. Cl. 335—20 **10 Claims**



1. A circuit breaker including a cooperating contact means, a manually operable overcenter spring-type operating mechanism for opening and closing said contact means, automatic trip means operatively connected to said operating mechanism and operative responsive to predetermined fault current conditions to actute said operating mechanism for opening said contact means, auxiliary means including a first section operable independently of said operating mechanism and said trip means to open said contact means responsive to a first control signal generated remote from said circuit breaker.

4,223,289

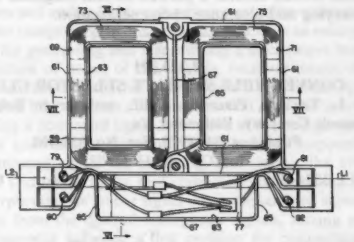
AC-DC MAGNET COIL ASSEMBLY FOR LOW DROPOUT AC CONTACTORS

Ralph B. Immel, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 2, 1979, Ser. No. 226

Int. Cl.² H01H *9/02, 13/04*

U.S. Cl. 335—202 **4 Claims**



1. An electromagnetic contactor comprising an insulating support, a stationary contact structure on said support, a movable contact structure on said support and movable between open and closed positions relative to the stationary contact structure, support means for supporting the movable contact structure for pivotal movement between said positions, electromagnetic means comprising a magnetic armature, a magnetic core, and a coil for actuating the support means, one of said armature and said core being on the insulating support and the other being on the support means, the core being a U-shaped magnetic member, the coil comprising a pickup winding, a holding winding and a bridge rectifier, container means

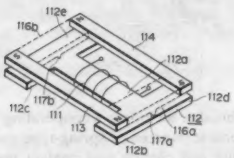
for the windings and rectifier and comprising a non-metallic molded insulating shell having two portions with one portion around one leg and the other portion around the other leg of the U-shaped member, the molded shell also having a third portion adjacent to said two portions, the pickup and holding windings being in the one and other portions of said shell respectively, and the rectifier being in said third portion.

4,223,290

ELECTROMAGNETIC DEVICE OF THE FLAT PACKAGE TYPE

Shunichi Agatahama, Osaka; Akio Masaki, and Yoshihide Bando, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 8, 1978, Ser. No. 968,028
Claims priority, application Japan, Dec. 24, 1977, 52/157095
Int. Cl.³ H01F 7/02; H01H 51/22
U.S. Cl. 335—229 **6 Claims**



1. An electromagnetic device comprising:

a stationary H-shaped substantially planar magnetic core consisting of a main core portion and four elongated end portions extending from said main core portion;

a pair of substantially planar magnetic members for alternately forming two closed magnetic circuits in cooperation with said magnetic core, at least a part of at least one of said magnetic members being comprised of a permanent magnet, said magnetic members being disposed in parallel with said main core portion and being integrally connected through a non-magnetic material to form an integral flat planar unit rotatable about a line parallel to said magnetic members, the tips of each of said magnetic members confronting the corresponding tips of said elongated core portions, the clearance between the tips of each magnetic members and the tips of the corresponding elongated core portions being changeable; and,

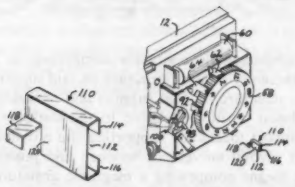
a coil wound around a portion of said magnetic core for varying said clearance upon energization.

4,223,291

CONVERTIBLE SET-BACK SELECTOR CLIP

Allen L. Teichert, Placentia, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 31, 1978, Ser. No. 938,393
Int. Cl.² H01H 37/02
U.S. Cl. 337—303 **8 Claims**



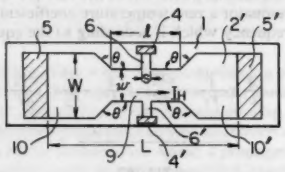
1. In a timer mechanism having a driven clock dial, a mechanism for sequential operational modes, juxtapositioned cam means operative, upon movement, to move said mechanism to a preselected operational mode, and at least one radial arm fixedly adjustably secured to said clock dial and bearing a respective lug to engage and move said cam means, the improvement comprising: at least one flange secured to said dial and a removeable arm clip having a receptacle groove to receive said flange and permit its removeable mounting on said flange in a position with its arm projecting radially from said dial a sufficient distance for operative engagement with said cam means.

4,223,292

HALL ELEMENT

Juichi Morikawa, Katsuta, and Nobuo Kotera, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 24, 1978, Ser. No. 927,392
Claims priority, application Japan, Jul. 25, 1977, 52-98358[U]
Int. Cl.² H01L 43/04
U.S. Cl. 338—32 H **9 Claims**



1. A Hall element of a generally criss-cross shape comprising a substrate, a pair of current-supplying electrodes, a pair of Hall voltage detecting electrodes, and a current-carrying layer formed of a semiconductor thin film on the substrate in a pattern of a butterfly-like shape,

said butterfly-shaped pattern of the semiconductor thin film layer comprising

a narrowed central portion having long sides parallel to a control-current path and short sides perpendicular to the long sides and constituting a magneto-sensitive portion of the Hall element,

a pair of wing-like regions integrally contiguous to the entire short sides of said central portion for carrying a control current, each of said wing-like regions being of a trapezoidal area, its short and long parallel edges being connected to the short side of the central portion and the current-supplying electrode, respectively, slant edges of the trapezoidal area forming an angle greater than 90 degrees and smaller than 180 degrees with the long sides of the central portion, to thereby provide heat sink for allowing a large amount of control current and suppress semiconductor noise generated in the element depending on the shape of the semiconductor layer, and

a head-like region and a tail-like region extending from the long sides of said central portion perpendicularly thereto and connected to said pair of Hall-voltage detecting electrodes, respectively.

4,223,293

TERMINAL PIN ARRANGEMENT FOR AN EXHAUST GAS SENSOR

Jerry L. Springer; Charles M. Wells, both of Livonia, and William F. Horn, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 22, 1979, Ser. No. 5,420
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 **6 Claims**

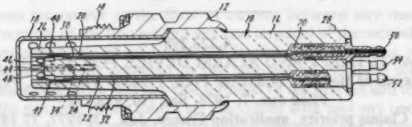
1. An improved exhaust gas oxygen sensor of the type adapted for installation in a conduit for conveying exhaust gases from an internal combustion engine, the improved sensor being responsive to the partial pressure of oxygen in the exhaust gases to which the sensor is exposed and having an

electrical characteristic which varies, when the sensor is at operating temperatures in the range from about 250° C. to about 850° C., with the partial pressure of oxygen in the exhaust gases, the improved sensor comprising:

a body adapted for connection to the exhaust conduit of an internal combustion engine;

an oxygen sensing element having a plurality of lead wires;

a ceramic insulator having a projecting portion for supporting the oxygen sensing element and having a terminal-pin portion for receiving terminal pins, the projecting portion being adapted to project into the exhaust conduit when the body is connected thereto as adapted therefor, the projecting portion of the insulator having a plurality of passages therein extending from the projecting portion to the terminal-pin portion of the insulator, the terminal-pin portion of such passages being enlarged to receive terminal pins, the oxygen sensing element being supported by the projecting portion of the insulator and having a plural-



ity of its lead wires extending through the passages in the insulator;

a plurality of terminal pins received in the insulator, each of the terminal pins having a shoulder portion located exterior of the enlarged portion of one of the passges therein, a second portion received within the enlarged portion of the passage and in contact therewith, and a third portion also received in the enlarged portion of the passage but not in contact therewith, the terminal pins being electrically connected to the wires in the passages; and

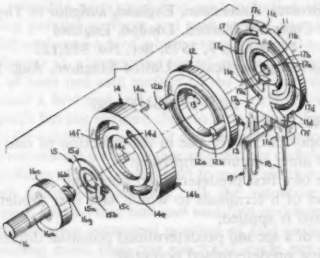
a cement material in the enlarged portions of each of the passages in the insulator, the cement material bonding the terminal pins to the insulator, the cement material being located within the space formed between the third portion of the terminal pin received in the enlarged portion of the passage but not in contact therewith, the cememt in such location providing a seal, whereby, leakage of exhaust gases, from the exhaust conduit to its surrounding environment via the terminal pins, is prevented.

4,223,294

VERNIER CONTROL

Jerry T. Moffitt, Muskego, and Robert W. Bulgrin, Ft. Atkinson, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 16, 1978, Ser. No. 951,769
Int. Cl.[2] H01C *10/18*
U.S. Cl. 338—122 **8 Claims**



1. A variable resistor control, which comprises:

a base;

a first resistance track disposed on the base;

a first movable contact engaging the first resistance track;

first adjustment means for positioning the first movable contact at various points of engagement along the first resistance track;

a second resistance track disposed on the based and spaced apart from the first resistance track to form a gap;

a termination track disposed in the gap, the termination track having a free end and having another end connected to the first resistance track;

a second movable contact having a pair of engagement surfaces;

second adjustment means for carrying the second movable contact in a position with one engagement surface contacting the termination track and with another engagement surface contacting the second resistance track, the second adjustment means being operable to move the engagement surfaces along their respective tracks to vary the portion of the second resistance track that is electrically connected to the first resistance track; and

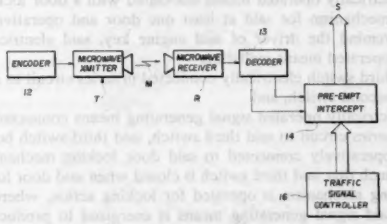
retaining means connected to the base for holding the second adjustment means in its operating position.

4,223,295

EMERGENCY CONTROL SYSTEM FOR TRAFFIC SIGNALS

Edgar L. Bonner, Taylorsville, N.C., and Nelson A. Faerber, 900 Sixth Ave. South, Naples on the Gulf, Fla. 33940, assignors to Nelson A. Faerber, Naples, Fla.

Filed Oct. 18, 1978, Ser. No. 952,554
Int. Cl.[2] G08G *1/07*
U.S. Cl. 340—32 **16 Claims**



1. An emergency control system for traffic signals including red, green and amber lights and a main controller connected to said lights comprising, in combination, means on an emergency vehicle for generating and transmitting a microwave beam in the direction of travel of the vehicle, receiver means operatively associated with the traffic signals for receiving said transmitted beam, means connected to said receiver means for generating a command signal indicative of an emergency condition, a control unit including control means responsive to said command signal for sampling and storing the existing status of said traffic lights, said control means including means for incorporating an amber signal when the sampled signals are different from the desired emergency signals, seizing switch means movable between a first position for connecting said traffic lights to said main controller and a second position for connecting said traffic lights to said control means, said seizing switch means being normally positioned in said first position, means conditioned by said command signal for moving said seizing switch means subsequent to the storage of the existing status of said traffic lights by said control means into said second position for connecting said traffic lights to said control means and means for resetting said seizing switch means including means for initiating an amber signal by said main controller in the direction of travel of said emergency vehicle when said command signal is terminated to permit said seizing switch means to move into said first position for operation of said traffic lights by said main controller.

4,223,296

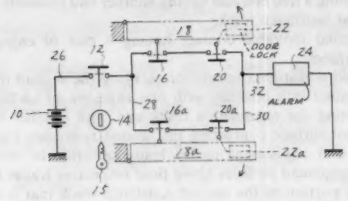
ENGINE KEY REMINDER SYSTEM FOR AUTOMOBILE

Mujo Kim, 55 Kujocho, and Yonsu Kim, 42 Kiyomizucho, both of Kisshoin, Minami-ku, Kyoto, Japan

Filed Dec. 1, 1978, Ser. No. 965,616

Int. Cl.[2] B60Q *5/00*

U.S. Cl. 340—52 D **4 Claims**



1. A system for an automobile for reminding a driver of an engine key inadvertently left inserted in an engine key switch of the automobile in which the automobile has at least one door with a locking mechanism comprising:

a source of electric current;

a first switch associated with said key switch and adapted to be kept closed while said engine key is inserted in said key switch, said first switch being connected to said source of electric current;

a second switch associated with at least one of the front doors of the automobile and adapted to be closed when said door is opened, said second switch being series connected to said first switch;

electrically operated means associated with a door locking mechanism for said at least one door and operative to remind the driver of said engine key, said electrically operated means including;

a third switch electrically connected in series circuit to said second switch, and

electrically operated signal generating means connected in series circuit to said third switch, said third switch being operatively connected to said door locking mechanism such that said third switch is closed when said door locking mechanism is operated for locking action, whereby said signal generating means is energized to produce a reminder signal when said first, second and third switches are closed.

4,223,297

SPEED ALARM SYSTEM FOR A MOTOR VEHICLE

Hiroyuki Nomura; Takaaki Mogi; Teruo Kawasaki, all of Yokohama; Masanori Mizote, Yokosuka; Kiyoshi Yamaki, Yokohama; Takashi Oka, Tokyo, and Hideoki Matsuoka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 14, 1979, Ser. No. 12,215

Claims priority, application Japan, Feb. 15, 1978, 53-16206

Int. Cl.[2] G08B *21/00*; **B60Q** *1/54*

U.S. Cl. 340—62 **9 Claims**

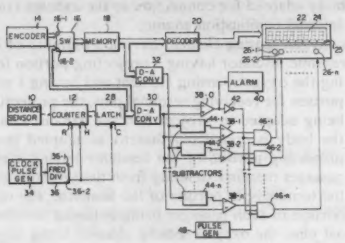
1. A speed alarm system for a motor vehicle comprising:

(a) means for producing a first signal indicative of the instantaneous vehicle speed;

(b) means for producing a plurality of second signals indicative of reference speeds which are of different values from each other;

(c) first display means for displaying one of said reference speeds;

(d) a plurality of comparators each responsive to said first signal and to a corresponding one of said second signals, each of said comparators producing an output signal when the vehicle speed indicated by said first signal has a predetermined relationship with respect to the reference speeds indicated by the corresponding one of said second signals; and



(e) a plurality of second display means each responsive to the output signal of a corresponding one of said comparators.

4,223,298

ANTI-THEFT AND ALARM DEVICE FOR A VEHICLE

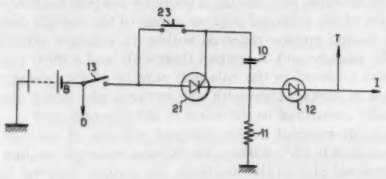
Raymond Bernier, 29,Avenue Foch, F-94300 Vincennes, France

Filed Jun. 7, 1978, Ser. No. 913,718

Claims priority, application France, Jun. 13, 1977, 77 18768; Jan. 9, 1978, 78 00852

Int. Cl.[2] B60R *25/04, 25/10*

U.S. Cl. 340—64 **5 Claims**



1. An anti-theft device for a vehicle having a source of direct current ignition means and connecting means including key-operated switching means, between the said source and the said ignition means; said anti-theft device comprising a solid-state controlled rectifier having an anode, a cathode and a gate; said connecting means including first circuit means connecting the said source to the said anode through the said key operated switching means and second circuit means connecting the said cathode to the said ignition means; said anti-theft device further comprising third circuit means, including a concealed temporarily closable switch, connecting the said key operated contact to the said gate.

4,223,299

INPUT CIRCUITS

David L. Broster, Amersham, England, assignor to The English Electric Company Limited, London, England

Filed Aug. 9, 1978, Ser. No. 932,127

Claims priority, application United Kingdom, Aug. 12, 1977, 33931/77

Int. Cl.[2] H04Q *3/00*

U.S. Cl. 340—166 R **6 Claims**

1. An input circuit for use in the selection of one of n×m inputs, the input circuit comprising:

a source of a first predetermined potential;

a first set of n terminals to which said first predetermined potential is applied;

a source of a second predetermined potential different from said first predetermined potential;

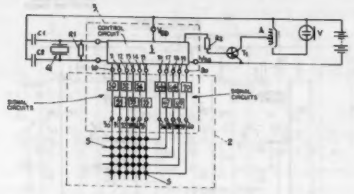
a set of m terminals to which said second predetermined potential is applied;

n×m single pole switches each connected between a termi-

nal of the first set and a terminal of the second set such that no two switches are connected to the same two terminals;

a third set of n terminals each associated with a respective one of the n terminals of the first set;

a fourth set of m terminals each associated with a respective one of the m terminals of the second set; and



means responsive to the flow of current between any one terminal of the first set and any one terminal of the second set when one of said switches is closed for applying a predetermined potential to the terminal of the third set associated with said any one terminal of the first set and to the terminal of the fourth set associated with said any one terminal of the second set to select a particular one of said n×m inputs corresponding to that switch.

4,223,300

ELECTRO MECHANICAL POSITION INDICATOR USING RELATIVELY MOVEABLE COILS

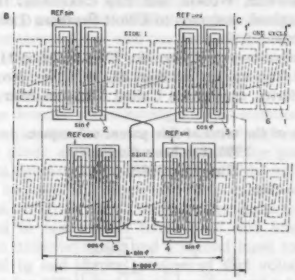
Klas R. Wiklund, Sandbroväigen, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Feb. 16, 1978, Ser. No. 878,373

Claims priority, application Sweden, Feb. 16, 1977, 7701675

Int. Cl.² G08C *9/00*; G01R *33/00*

U.S. Cl. 340—196 **28 Claims**



1. Electromechanical apparatus comprising first and second relatively rotatable parts, said first part including two oppositely facing parallel surfaces and said second part including two parallel surfaces each of which extends parallel to, and lies closely adjacent to, a respective one of said two surfaces of the first part, at least one said surface of the first part having secured thereto a first coil and the said two surfaces of the second part each having secured thereto at least one further coil and means for mounting said first and second parts for relative rotational movement so as to cause said further coils secured to the two surfaces of said second part to move along a predetermined path relative to said first coil, the inductive coupling between each said further coil and said first coil being dependent on the relative rotational position of said parts and said coils providing more than one electrical cycle per complete mechanical rotation of said relatively rotatable parts, an alternating current voltage being supplied to said first coil and coupled to said further coils, said apparatus further comprising electronic processing means for producing an output representative of said relative rotational position, said processing means being connected to said further coils and comprising electronic storage means having a plurality of storage locations which are individually addressable in response to addressing signals, means for deriving said addressing signals including counter means for counting said electrical cycles so as to identify the relevant sector of the mechanical rotation of said relatively rotatable parts, the said addressing signals being supplied to an address input of said storage means and said storage means further acting to store correction signals corresponding to respective measured values representative or angular positions in the relevant sectors of said mechanical rotation, and correction means for receiving said correction signals from said storage means and for correcting said measured values in accordance with said correction signals, said correction means providing a said output representing each measured value thus corrected.

4,223,301

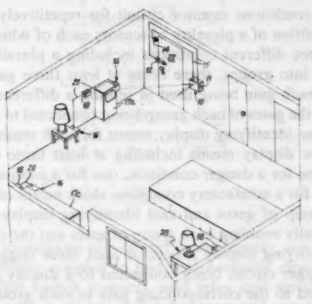
APPARATUS FOR CONSERVING ENERGY IN ELECTRICAL APPLIANCES

Johnny C. Grimes, 873 Grand Cir., Las Vegas, Nev. 89101; Richard L. Pierce, 6641 Sambar Cir., Cypress, Calif. 90630; Jimmy R. Payne, 3584 S. Bronco Rd., Las Vegas, Nev. 89102, and Nate Schlaifer, 1314 Sweeney Ave., Las Vegas, Nev. 89104

Continuation-in-part of Ser. No. 797,382, May 16, 1977, Pat. No. 4,101,886. This application Apr. 10, 1978, Ser. No. 895,062

Int. Cl.² G08B *19/00*

U.S. Cl. 340—500 **13 Claims**



1. A device for conserving energy consumption by appliances within a room having a door when the room is unoccupied by an occupant, which device comprises:

(a) a source of energy;

(b) means for connecting the appliances to the source of energy;

(c) control means for causing the connecting means to connect or disconnect the appliances and the source of energy;

(d) sensing means responsive to the ingress to and egress from the room by the occupant, which sensing means includes;

(1) first switch means responsive to activation by the occupant, and

(2) second switch means responsive to the opening and closing of the door;

(e) wireless transmitting means activated and inhibited by the sensing means for wireless transmitting control signals to the control means, thereby causing the appliances to be connected to or disconnected from the source of energy responsive to the ingress to or egress from the room by the occupant; and

(f) third switch means responsive to activation by the occu-

pant for activating said transmitting means in the absence of the activating of said transmitting means by said sensing means.

4,223,302

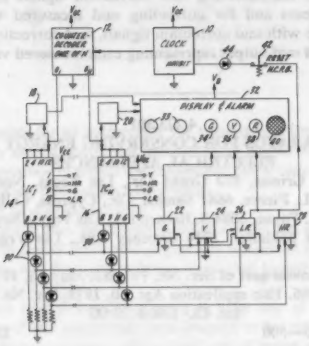
CONDITIONS MONITORING DEVICE

Guy E. Hocking, Tularosa, N. Mex., assignor to Marvel Engineering Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 805,723, Jun. 13, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,398

Int. Cl.[2] G08B *25/00*

U.S. Cl. 340—525 **1 Claim**



1. A conditions monitor circuit for repetitively displaying the condition of a plurality of sensors each of which detect at least three different conditions including a plurality of gates divided into groups, there being at least three gates in each group, each gate being used in sensing a different condition, with all the gates of each group being connected to a particular sensor, an identifying display means for each sensor, common condition display means including at least three display devices, one for a danger condition, one for a caution condition and one for a satisfactory condition, clock means connected to each group of gates and said identifying display means for sequentially enabling each group of gates and the corresponding identifying display means, at least three trigger circuits, each trigger circuit being connected to a display device and connected to the corresponding gate in each group of gates, and interconnections between said trigger circuits whereby at least one of said trigger circuits, when activated, disables the others.

4,223,303

ALARM DEVICES FOR INTERCONNECTED MULTI-DEVICE SYSTEMS

Harry Albinger, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,426

Int. Cl.[2] G08B *17/00*

U.S. Cl. 340—531 **10 Claims**

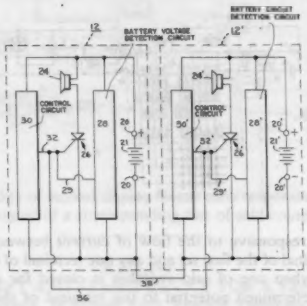
1. An alarm device adapted for use in a multi-device alarm system, said alarm device comprising:

terminal means for connection to a source of electric power,

an alarm circuit coupled to said terminal means, said alarm circuit comprising normally conductive alarm means connected in series with a normally non-conductive (OFF) switching means,

control means including sensing means for sensing an adverse condition, said control means having output means coupled to said switching means for supplying an output signal to said switching means when an adverse condition is sensed by said sensing means, said switching means switching to a conductive state (ON) only while an output signal is supplied thereto, and

circuit means connected to said output means for permitting the interconnection of said output means to the output means of one or more other alarm devices such that an output signal generated by said control means will be



supplied to the switching means of all of the interconnected alarm units, whereby the alarm means of all of the interconnected alarm devices that are connected to a source of electric power will be operated in response to the sensing of an adverse condition by the sensing means of any one of the interconnected alarm devices.

4,223,304

VIBRATION RESPONSIVE INTRUDER ALARM SYSTEMS

Peter J. Barowitz, Welwin, and Roy Baxendale, Harpenden, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

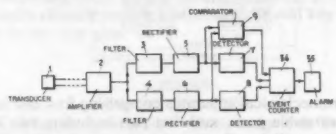
Continuation-in-part of Ser. No. 776,438, Mar. 11, 1977, abandoned. This application Apr. 21, 1978, Ser. No. 898,901

Claims priority, application United Kingdom, Mar. 16, 1976, 10493/76

The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.

Int. Cl.[2] G08B *13/22*

U.S. Cl. 340—566 **7 Claims**



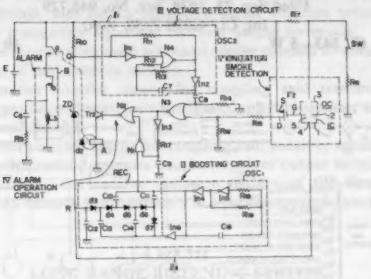
1. An intruder alarm system comprising at least one electromechanical transducer that provides electric signals in response to vibrations incident thereon, which electric signals may extend over a range of frequencies, first and second bandpass filter means to pass components if said electric signals in respective bands of frequencies within said range, respective means to rectify said signal components to provide first and second electric waveforms, first and second detector circuit means each arranged to give an output signal if a respective one of said electric waveforms exceeds a respective reference signal by more than a predetermined amount, and gating means selectively to pass an output signal from said first detector circuit means to alarm indicating means in dependence upon an output signal from said second detector circuit means.

4,223,305

SINGLE STATION TYPE IONIZATION SMOKE SENSOR

Takeo Arima, Tokyo, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Aug. 17, 1978, Ser. No. 934,591
Claims priority, application Japan, Aug. 19, 1977, 52/111312
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—629 3 Claims



1. A single station type ionization smoke sensor comprising:

a battery having a first terminal connected to ground and a second terminal;

an ionization-type smoke detector means having first and second opposed electrodes and an output electrode for detecting combustion products and generating an output signal on said output electrode;

a primary power feed conductor connected between said second terminal of said battery and said first opposed electrode;

a voltage booster means connected to said battery and having a booster terminal for generating a boosted voltage signal on said booster terminal having a voltage higher than the voltage of said battery and opposite in polarity to the voltage on said second terminal of said battery;

a secondary power feed conductor connected between said booster terminal and said second opposed electrode;

a series connection of a resistor element and a zener diode connected between said primary and secondary power feed conductors;

a voltage detector means having an input terminal connected to the junction between said resistor element and said zener diode and an output terminal, for generating an output signal on said output terminal if the voltage on said input terminal falls below a predetermined value; and

an alarm energizer circuit having a first input terminal connected to said output terminal of said ionization-type smoke detector means and a second input terminal connected to said output terminal of said voltage detector means for generating an alarm when said ionization-type smoke detector means generates said output signal and for generating an alarm when said voltage detector means generates said output signal.

4,223,306

DEVICE FOR DETECTION OF SHORT CIRCUITS IN INDUSTRIAL USES

Richard A. Reimer, Tacoma, Wash., assignor to Atlas Foundry & Machine Co., Tacoma, Wash.

Continuation of Ser. No. 745,300, Nov. 26, 1976, abandoned.
This application Jul. 24, 1978, Ser. No. 927,298
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—650 1 Claim

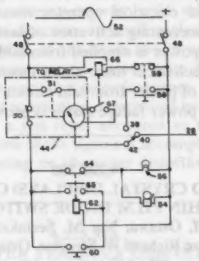
1. An electrical malfunction alarm circuit for detecting a malfunction in an electrical power circuit that supplies electrical power to an industrial arc furnace, the electrical power circuit including a power source connected to a vaccum-operated switch which in turn connects to the primary of a transformer, which transformer, in turn, is connected through a plurality of conductors to the arc furnace, the electrical malfunction alarm circuit adapted to detect the presence of electrical power at the arc furnace when the vacuum-operated switch is in an open condition, said electrical malfunction circuit comprising:

a voltage detection meter relay serially connected on one side thereof through a first control switch to one side of a power supply and serially connected on the other side thereof through a second control switch to one of the conductors extending between the transformer and the arc furnace;

a third control switch serially connected between said one side of said power supply and one side of an alarm circuit, the other side of said alarm circuit connected to said other side of said power supply;

said voltage detection meter relay adapted, when the voltage across said meter relay is below a predetermined set value, to place the first and third switches in their closed and opened positions, respectively, and when said voltage across said meter relay is above the predetermined set value, to open said first switch and close said second switch to supply electrical power to said alarm circuit;

said alarm circuit including a visual alarm device and an audio alarm device connected in parallel with each other and between said other side of said power supply and first normally closed relay-controlled switch contacts con-



nected to said one side of said power supply, a relay coil magnetically coupled to said first normally closed relay controlled switch contacts, said relay coil serially connected with a silence switch between said one side and said other side of said power supply, first normally open relay controlled switch contacts connected in parallel with said silence switch whereby operation of said silence switch causes said relay coil to open said normally closed relay switch contacts to interrupt the alarm device circuit and close said normally open relay-controlled switch contacts to latch said normally open relay controlled switch contacts in the closed position;

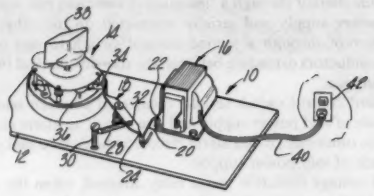
a test circuit including a test switch having normally open contacts connected between said other side of said power supply and said voltage detector meter relay, so that when said test switch is closed, electrical power is supplied to said voltage detector relay to cause it to open said first switch and close said second switch to actuate said alarm circuit; and

a time delay relay mechanically connected to a reset switch connected to said voltage detector meter relay, said time delay relay having a relay coil serially connected from said one side of said power supply through a set of normally closed switch contacts of said test switch to the other side of said power supply, said normally closed switch contacts, when opened in response to actuation of said test switch, causing said time delay relay to reset said voltage detector meter relay.

4,223,307
DELAYED POWER INTERRUPTION ALARM

James W. Albritton, 1611 SE 40th St., Cape Coral, Fla. 33904

Filed Sep. 7, 1978, Ser. No. 940,257
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—656 4 Claims



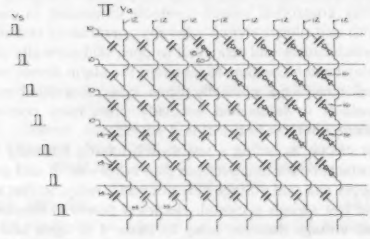
1. A delayed power interruption alarm for detecting an interruption of power in a circuit, said arrangement comprising:

mechanical timer-alarm means, comprising: a spring-wound timer; means including an adjustment member selectively positionable to positions corresponding to a timed interval; and, an alarm activated to generate an alarm signal after a predetermined delay corresponding to said timed interval;

electrical operator means adapted to be powered by said circuit, said electrical operator means including means normally preventing activation of said timer-alarm means as long as power is supplied from said circuit, and releasing said mechanical timer-alarm means upon cessation of the supply of power from said circuit, whereby an adjustable delay power failure alarm is provided.

4,223,308
LCDS (LIQUID CRYSTAL DISPLAYS) CONTROLLED BY THIN FILM DIODE SWITCHES

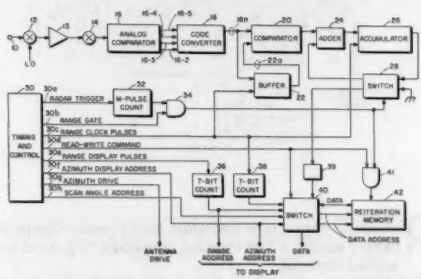
David R. Baraff, Ottawa; Nur M. Serinken, Kanata; Carla J. Miner, Nepean; Richard W. Streater, Ottawa, and Vladimir F. Drobny, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 25, 1979, Ser. No. 60,290
Int. Cl.[3] G09F 9/35
U.S. Cl. 340—719 19 Claims

1. A display cell comprising a pair of plates flanking an electro-optic material, the optical transmissivity of the electro-optic material being dependent on potential difference applied across the material, at least one of the plates being transparent, the display cell having a plurality of picture elements, each picture element defined by a pair of opposed thin film electrodes on the inside faces of the respective plates, thin film conducting means on said plates for applying a voltage between the opposed electrodes of each element, and a plurality of switch elements series connected to and controlling respective picture elements, the switch elements each comprising a pair of back-to-back, series-connected, thin film diodes.

4,223,309
TURBULENCE DETECTOR FOR NON-COHERENT PULSE RADAR

Delmar V. Payne, Ferndale, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 25, 1978, Ser. No. 945,729
Int. Cl.[2] G01S 7/30, 9/60
U.S. Cl. 343—5 W 10 Claims



5. A weather detector for use with a non-coherent pulse radar system having means for detecting radar return signals as said radar system sweeps through a field of interest comprising:

means for converting at least one range cell of each said radar return signal to a digital number comprising a predetermined portion of an azimuth line of radar return data;

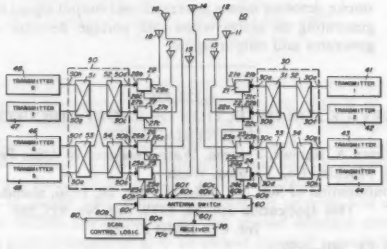
means for temporarily storing each digital number; and,

means for comparing a stored digital number of a particular range cell with a subsequent digital number of the same particular range cell, the result of said comparison when the compared digital numbers are different being a measure of weather severity.

4,223,310
MULTI-TRANSCEIVER ANTENNA

Allen L. Davidson; Pitt W. Arnold, both of Crystal Lake, and Morton Stern, Skokie, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 801,194, May 27, 1977, abandoned.
This application Oct. 2, 1978, Ser. No. 947,383
Int. Cl.[2] H04B 7/00; H01Q 3/24
U.S. Cl. 343—100 CS 4 Claims



1. An antenna system adapted for simultaneous transmit and receive operation comprising:

an antenna array having a plurality of sectors, the sectors being arranged in a predetermined configuration;

transmitter means for producing signals to be radiated over said antenna sectors;

receiver means adapted for receiving signals over said antenna sectors;

a plurality of antenna coupler means, each antenna coupler having a transmitter input terminal, a receiver output terminal and an antenna terminal, the antenna coupler means including means to couple signals at the transmitter input terminal to the antenna terminal and to couple signals from the antenna terminal to the receiver output terminal, said means providing signal isolation between the transmitter input and receiver output terminals;

means for coupling each antenna coupler antenna terminal to one of said antenna sectors;

transmitter coupler means for coupling said transmitter means to predetermined antenna coupler transmitter input terminals; and

receiver coupler means for coupling said receiver means to predetermined antenna coupler receiver output terminals such that the receive radiation pattern of the antenna array extends predominately in a predetermined direction.

4,223,311

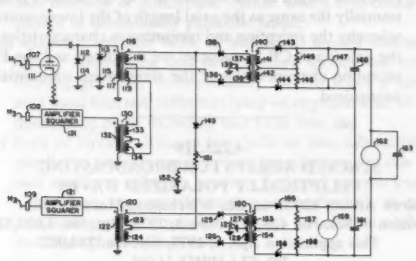
LONG RANGE LISTENING SYSTEM

Herman E. Ellingson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 29, 1956, Ser. No. 568,681

Int. Cl.³ G01S 3/02

U.S. Cl. 343—112 D **1 Claim**



1. A system for locating the position of an energy radiating source comprising three radiated energy receiving means arranged in predetermined substantially linear spaced positions and each producing an output signal in response to energy received thereby, a plurality of individual signal clipping means respectively connected to each of said receiving means for limiting the characteristics of said output signal therefrom to the instantaneous polarity of said signal, means connected to the respective signal clipping means for effecting polarity correlation between the clipped output signals of a predetermined pair of signal receiving means, electrical means serially connected between said receiving means and said correlation means for selectively introducing a delay of the signal from at least one signal receiving means sufficient to maximize the polarity correlation of said signals, said electrical delay means being calibrated to give the bearing to said source, a second means for effecting polarity correlation, the third energy receiving means being positioned intermediate and in aligned spaced relation to said predetermined pair of energy receiving means when the signals of said pair are in maximum polarity correlation, an additional electrical delay means connected between the third receiving means and said second means for maximizing polarity correlation between the clipped signals from the three receiving means, said additional electrical delay means being calibrated to indicate the range to said source when the clipped signals of said three receiving means are in maximum polarity correlation.

4,223,312

DIRECTIVE RADIO COMMUNICATION TRANSMISSION SYSTEM FOR MAINTAINING THE ALIGNMENT OF TRANSMISSION AND RECEIVER ANTENNA

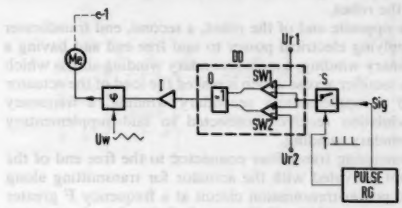
Josef Gammel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,167

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724198

Int. Cl.² G01S 5/02

U.S. Cl. 343—117 R **3 Claims**



1. A directive radio communication transmission system having directive transmitting and receiving antennas in which the radiating direction of the receiving and transmitting antennas are automatically and continuously altered by repetitively shifting the antenna pattern primarily in the vertical direction from the initial beam direction, in small angles in comparison to the half-power width of the beam and in which the maximum antenna response occurs in various beam directions of the two antennas with the smallest error frequency when transmitting digital form communication determined by comparing the error frequency of a test level allocated to the signal, and wherein the evaluation of the signals is accomplished by determining the eye-opening or character distortion under multipath influences.

4,223,313

POWER TRANSFER CIRCUIT

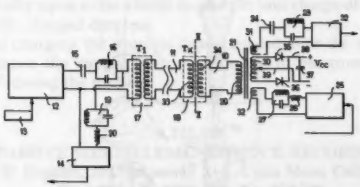
Jean Chabrol, Asnieres, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Oct. 10, 1978, Ser. No. 950,024

Claims priority, application France, Oct. 19, 1977, 77 31461

Int. Cl.² H04B 5/02

U.S. Cl. 340—870.07 **4 Claims**



1. A control circuit for a manipulator robot of the type having a power source and a device which controls the functioning of the robot, said robot having a plurality of connection joints between the power source and a free end having an end axis and an actuator, said control circuit transmitting electrical power along the members of the robot to carry remote control instructions from the control device to the free end of the robot, said robot comprising:

generator means for generating alternating-current electrical power at a predetermined frequency,

a power-transmission circuit for conducting said power from said generator means to said actuator,

said circuit including rotary means connecting successive portions of said circuit without continuous contact, and, at least at one of the robot's joints, enabling rotation of one member of the robot and of said transmission circuit with respect to another member of the robot, each said rotary means comprising

a first transformer with its primary and secondary windings each housed in a separate ferrite core, the cores being rotatable relative to each other in parallel planes around a common axis, and

control transmitting means to carry remote control instructions comprising

a remote control transmitter which modulates the frequency of the power generated by the power generator at one end of the robot,

at the opposite end of the robot, a second, end transformer supplying electrical power to said free end and having a primary winding, a main secondary winding across which is a rectifier across which is placed the load of the actuator and a supplementary secondary winding, a frequency modulation receiver connected to said supplementary secondary winding,

a telemetering transmitter connected to the free end of the robot provided with the actuator for transmitting along said power-transmission circuit at a frequency F greater than a transmission frequency f of the power generator, and

a telemetering receiver tuned to the frequency F connected at the opposite end of the power-transmission circuit

said telemetering receiver being connected to said power-transmission circuit F in parallel with said generator means and via a filter L-C circuit which conducts at frequency F at an impedance approaching zero and presents to frequency f an impedance approaching infinity,

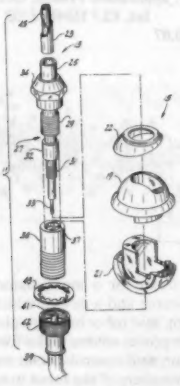
said power generator being connected to said power transmission circuit via a filter L-C circuit which conducts the frequency f at an impedance approaching zero and presents to the frequency F an impedance approaching infinity.

4,223,314

AM-FM AND CB ANTENNA

Elasco A. Tyrey, and Rosemary C. Tyrey, both of 239 Estridge, St. Louis, Mo. 63137

Filed Nov. 16, 1978, Ser. No. 961,292
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 **9 Claims**



1. An antenna for receiving radio frequency transmissions in the AM and FM radio frequency bands and for receiving and transmitting CB radio transmissions, comprising:

a base adapted to be mounted on an automobile, said base also being adapted to be electrically connected to the outer conductor of a conventional automobile radio coaxial cable and to the body of said automobile;

a generally elongate lower antenna section attached to and extending above the base but electrically insulated therefrom, said lower section having an electrical length selected to maximize reception of radio frequency transmissions in the FM band, said electrical length at a predetermined FM frequency being substantially one-fourth the wavelength of a radio transmission at said predetermined frequency, the electrical length and the axial length of said lower section being substantially the same, said lower section being adapted to be connected to the inner conductor of said conventional automobile radio coaxial cable; and

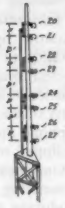
a generally elongate upper antenna section extending above the upper end of the lower section and including a concealed loading coil electrically connected to the lower section, the cross section of the upper section being substantially the same as that of the upper end of the lower section, the silhouette of the antenna being substantially unbroken where the upper section meets the lower section, thereby disguising the fact that the upper section includes a loading coil, said loading coil having a sufficient number of turns to make the electrical length of said antenna at a preselected CB tuning frequency substantially one-fourth the wavelength of a radio transmission of said preselected frequency, said electrical length of the antenna at the preselected CB tuning frequency being greater than the axial length of the antenna above the base, the impedance of the loading coil being such that the electrical length of the antenna at FM frequencies is substantially the same as the axial length of the lower section, whereby the reception and transmission characteristics of the antenna at CB frequencies are improved and the FM reception characteristics of the antenna are substantially unimpaired.

4,223,315

STACKED ARRAYS FOR BROADCASTING ELLIPTICALLY POLARIZED WAVES

Andrew Alford, 120 Cross St., Winchester, Mass. 01890

Division of Ser. No. 628,247, Nov. 3, 1975, Pat. No. 4,031,536.
This application Apr. 4, 1977, Ser. No. 784,062
Int. Cl.[2] H01Q 11/14
U.S. Cl. 343—742 **6 Claims**



1. Antenna array radiating elliptically polarized waves comprising a plurality of radiating elements

(1) each radiating element comprising a metal cylinder formed into a loop having a center portion and two end portions, said end portions being bent in opposite directions from the plane of the major portion of the loop,

(2) the central portions of the bent cylinders carrying substantially greater high frequency currents than the end portions

(3) means for spacing the radiating elements in pairs at distances A above each other, means for spacing the radiating elements below each other such that the average

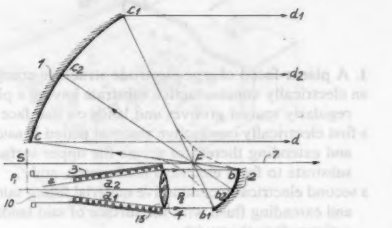
distance between the elements is between 0.667 and 85 wavelengths.

4,223,316

ANTENNA STRUCTURE WITH RELATIVELY OFFSET REFLECTORS FOR ELECTROMAGNETIC DETECTION AND SPACE TELECOMMUNICATION EQUIPMENT

Serge Drabowitch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 23, 1978, Ser. No. 889,564
Claims priority, application France, Mar. 25, 1977, 77 09000
Int. Cl.[2] H01Q 19/12
U.S. Cl. 343—781 P 7 Claims



1. An antenna structure comprising:

a main reflector of noncircular outline with a first concave surface of substantially parabolic shape;

an auxiliary reflector with an astigmatic second concave surface confronting said first concave surface and conforming generally homothetically thereto about a common focal line, said reflectors lying on opposite sides of an intervening plane including said focal line; and

a horn of circular cross-section with an axis substantially parallel to said intervening plane extending on the side of said auxiliary reflector between first and second transverse planes respectively passing perpendicularly to said intervening plane through the vertex of said first surface and through said focal line.

4,223,317

DUAL POLARIZATION ANTENNA COUPLETS

Robert L. Rod, Marina Del Rey, Calif., assignor to Monogram Industries, Inc, Santa Monica, Calif.

Filed Dec. 27, 1977, Ser. No. 864,934
Int. Cl.[2] H01Q 19/26, 9/38
U.S. Cl. 343—803 3 Claims

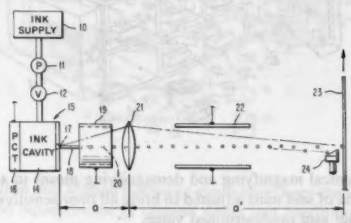
1. An antenna couplet comprised of a vertical radiator with its lower end positioned in the center of a dipole radiator, where each radiator is an electrically conductive element and the dipole radiator droops from the center to the ends in a continuous curve, wherein the dipole radiator droop at each end is equal to about 45° as measured between a horizontal axis and a line between the center of the dipole radiator and the end thereof, wherein the vertical radiator and dipole radiator are driven equally and in phase for radiation of a wavefront polarized at an angle of about 45° from the vertical, and wherein the vertical radiator is a folded dipole a quarter wavelength long.

4,223,318

METHOD AND APPARATUS FOR COMPENSATING FOR INSTABILITY OF A STREAM OF DROPLETS

E. Hal Bogardus, Poughkeepsie; Walter W. Hildenbrand, Brewster, and Menachem Levanoni, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1977, Ser. No. 858,980
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—1.1 18 Claims



1. A method for compensating for instability of a stream of droplets including:

directing a pressurized liquid stream from a supply source toward a receiving means;

breaking up the stream into droplets spaced substantially uniform distances after the stream leaves the supply source;

charging at least some of the droplets to be charged;

electrostatically focusing each of the charged droplets after break up of the stream into droplets on a selected position of the receiving means to compensate for instability of the stream of droplets due to the stream of droplets failing to remain aligned while preventing any resultant change in velocity of the charged droplets due to electrostatically focusing each of the charged droplets;

electrostatically focusing each droplet by disposing at least two electrodes with apertures of substantially the same size so that at least each of the charged droplets passes through the apertures after formation, positioning the electrodes a distance no greater than one of the dimensions of the apertures from each other in the direction of the stream, and applying a substantially higher potential to at least one of the electrodes than to another of the electrodes to produce an electric field gradient therebetween sufficient to produce a radial force on each of the charged droplets, the substantially higher potential being substantially equal to the kinetic energy per unit charge of each of the charged droplets;

and charging the droplets to be charged after the droplets leave the supply source and prior to electrostatically focusing the droplets.

4,223,319

PASSIVE MULTIELEMENT SHOCK RECORDER

Paul D. Engdahl, 2850 Monterey Ave., Costa Mesa, Calif. 92626

Filed Dec. 29, 1978, Ser. No. 974,340
Int. Cl.[3] G01D 15/02
U.S. Cl. 346—7 11 Claims

1. A multi-unit accelerograph instrument comprising:

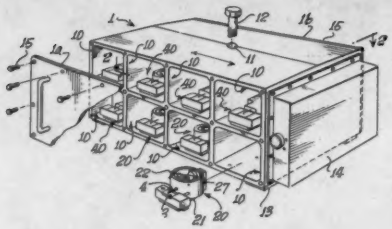
a case having a plurality of contiguous similar walled compartments; and

a plurality of accelerograph units mounted one in each said compartment and including units of different types,

each said unit comprising a lightly-damped resonant mass-spring system and a recording element moved thereby across a recording medium and having a predetermined sensitivity in terms of recording element deflection per unit acceleration, and a predetermined natural frequency,

said natural frequency being graded over a range of at least about 10 to 1 among said units, and

said sensitivity being generally about the same predetermined value in all said units, and



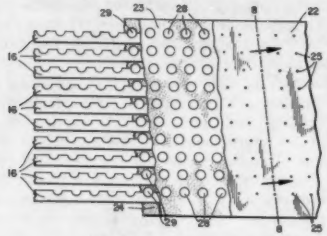
mechanical magnifying and demagnifying means in at least some of said units adjusted to bring all their sensitivities to about said predetermined value.

4,223,320

JET PRINTER AND ELECTRODE ASSEMBLY THEREFOR

Suresh C. Paranjpe, Dayton, and John W. Donahue, Bellbrook, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 18, 1978, Ser. No. 970,481
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **11 Claims**



1. Ink jet printing head comprising:

(a) a manifold for maintaining a supply of pressurized ink,

(b) an orifice plate communicating with said manifold and provided with a plurality of rows of regularly spaced orifices for generating a plurality of rows of continuously flowing ink streams, the orifices in each row being staggered with respect to the orifices in the other rows,

(c) a plurality of electrode assemblies positioned below said orifice plate for charging and deflecting drops which are naturally produced by said streams, each electrode assembly having an electrode face provided with a series of exposed electrodes for selectively charging and deflecting drops in different corresponding streams within one of said rows and each electrode extending substantially parallel to its associated stream for a sufficient distance to bracket substantially all natural, non-stimulated drop breakoff positions and charge and deflect drops which break off from the stream at any of such positions,

(d) different catching faces for catching drops deflected by respective ones of said electrodes,

(e) removal means for removing from said catching faces all of the liquid accumulating as a result of said catching, and

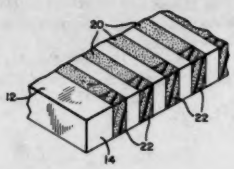
(f) electrical lead means connected to said electrodes for application thereto of charge/deflect signals.

4,223,321

PLANAR-FACED ELECTRODE FOR INK JET PRINTER AND METHOD OF MANUFACTURE

E. J. Doyle Kenworthy, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 30, 1979, Ser. No. 34,710
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. A planar-faced charge electrode structure comprising,

an electrically nonconductive substrate having a plurality of regularly spaced grooves and lands on one face thereof,

a first electrically conductive material plated in said grooves and extending therefrom across the upper surface of said substrate to form electrical lead means, and

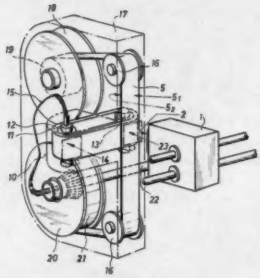
a second electrically conductive material filling said grooves and extending flush with the surface of said lands forming a planar face therewith.

4,223,322

MAINTAINING THE NOZZLE SURFACE OF AN INK WRITING HEAD

Cornelis van Raamsdonk, Schortens, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,870
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754630; Dec. 17, 1977, 2756334
Int. Cl.[2] G01D *15/18*; B41J *3/04*
U.S. Cl. 346—140 R **13 Claims**



1. A method for cleaning the nozzle surface of an ink writing head installed in an ink printer, which ink writing head is provided with a plurality of nozzles each nozzle having its outlet opening located at the nozzle surface, and variable volume chambers in flow connection with the nozzles for discharging ink in droplet form, comprising: bringing a liquid-absorbing cleaning medium into contact with at least those portions of the nozzle surface which surround the nozzle outlet openings for establishing a flow of ink from the nozzles into the medium; maintaining such contact for a period to permit ink to flow from the nozzles in the direction toward the cleaning medium and to be absorbed by the cleaning medium, whereby such nozzle surface portions are wetted by a liquid phase in which particles to be removed are dissolved; and removing the

cleaning medium from the nozzle surface at a time at which the cleaning medium which was in contact with the nozzle surface continues to exhibit a liquid absorbing capability in order to carry such particles away from the nozzle surface.

4,223,323

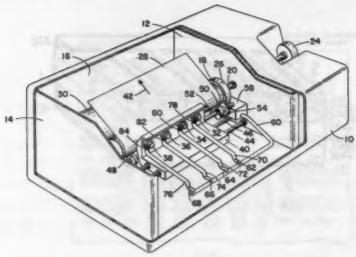
INK JET PRINTER

Leonhard Bader, Stadtbergen; Frank Giessner, and Helmut Weber, both of Augsburg, all of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 15, 1978, Ser. No. 969,903

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **13 Claims**



1. In an ink jet printer, means for supplying ink in continuous manner to a plurality of ink jet print heads movable in back and forth direction across the printer comprising: an

ink container secured to said printer and including rigid conduit means extending in the direction of movement of said print heads, and a

plurality of flexible passageways pivotally connected with said conduit means and flexibly connected with respective print heads for supplying ink thereto, said passageways extending substantially perpendicular to the direction of movement of said print heads and being constructed to have one end thereof distal from said conduit means swingably movable a predetermined distance in the direction of movement of said print heads.

4,223,324

LIQUID EJECTION SYSTEM WITH AIR HUMIDIFYING MEANS OPERATIVE DURING STANDBY PERIODS

Kiyoshi Yamamori, and Akira Mizoguchi, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1979, Ser. No. 20,977

Claims priority, application Japan, Mar. 17, 1978, 53-31394

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **6 Claims**

1. A liquid ejection system comprising:

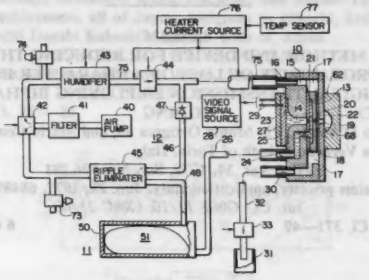
a liquid supply source;

a source of pressurized dry air;

a writing head comprising a liquid chamber connected to said liquid supply source for holding liquid therein, a liquid discharge channel, an electromechanical transducer responsive to electrical signals applied thereto for generating rapid pressure rises in the liquid in said liquid chamber for ejecting liquid through said liquid discharge channel, an air chamber connected to said source of pressurized dry air, an air discharge channel coaxially aligned with said liquid discharge channel for discharging air and liquid into the atmosphere, and an air outlet channel, said writing head being movable from a standby position in the absence of said electrical signals to operative positions in the presence of said electrical signals;

means for closing said air discharge channel of said writing head when the same is in said standby position; and

means for humidifying air supplied from said air supply source when said writing head is in said standby position to allow moisture laden air to pass through a space between said aligned discharge channels to keep the liquid in said liquid discharge channel under wet condition.



4,223,325

RECORDING DEVICE

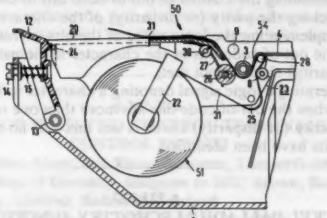
Hans Ebert, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 962,892

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754108

Int. Cl.² G01D *15/28*

U.S. Cl. 346—145 **11 Claims**



1. In a recording device for recording electrical signals on a moving ribbon-shaped recording medium, said device having a housing, which contains a drive means connected to a feed roller for the recording medium and supports at least one writing needle and means for actuating said needle in response to the electrical signals, said device having a carriage for supporting a supply of the recording medium being releasably inserted into the housing, said carriage providing at least one writing edge for supporting and recording medium as the writing needle writes thereon, said device having a plurality of guide rollers for guiding the recording medium and at least one pressure roller coacting with the feed roller to advance the recording medium, the improvements comprising the housing supporting a first pressure roller adjacent to the end of the writing needle, the carriage supporting a second pressure roller and being provided at one end with a preformed part for supporting the writing edge between the feed roller and the first pressure roller, said preformed part having a configuration that approximates the path of the recording medium as it is passed between the feed and pressure rollers and is engaged by the guide rollers, said carriage supporting at least one guide roller coacting with the writing edge to place the recording medium in the approximate position as the carriage is being inserted into the housing so that after completion of the inser-

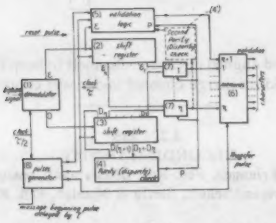
tion of the carriage, the recording medium is automatically disposed in the proper path around the writing edge and between the pressure and feed rollers.

4,223,326

METHOD AND DEVICE FOR REDUCING THE PROBABILITY OF LOSS OF A CHARACTER IN A DIGITAL TRANSMISSION EMPLOYING BIPHASE CODING

Paolo D'Amato, Via Monte Ortigara 35, and Mario Cominetti, Via Verbano 5, both of Turin, Italy

Filed Apr. 14, 1978, Ser. No. 896,281
Claims priority, application Italy, Jun. 28, 1977, 68489 A/77
Int. Cl.[2] G06F *11/10*; G08C *25/00*
U.S. Cl. 371—49 **6 Claims**



1. A method for reducing the probability of loss of a character provided with a parity (or disparity) bit in biphase coded digital communications, comprising:

identifying the bits out-of-code of each character;

determining the number of out-of-code bits in the character;

checking the parity (or disparity) of the character

complementing the logic value of the bits corresponding to the out-of-code bits in the character if the parity (or disparity) check is not met;

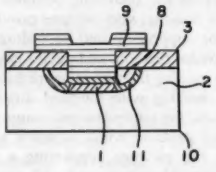
generating a logic signal denoting a character to be inhibited when the out-of-code bits are more than one or when the parity (or disparity) check is not met and no out-of-code bits have been identified.

4,223,327

NICKEL-PALLADIUM SCHOTTKY JUNCTION IN A CAVITY

Aiichiro Nara; Hisao Kondo; Takeji Fujiwara, and Hideaki Ikegawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 736,813, Oct. 29, 1976, abandoned.
This application May 24, 1978, Ser. No. 909,108
Claims priority, application Japan, Oct. 29, 1975, 50-130269
Int. Cl.[2] H01L *29/48*
U.S. Cl. 357—15 **8 Claims**



1. A Schottky barrier semiconductor device comprising:

a semiconductor substrate having a hollow in part of one of its main surfaces;

a surface protecting film formed on said main surface and having a flange-like portion extended over the peripheral edge of said hollow; and

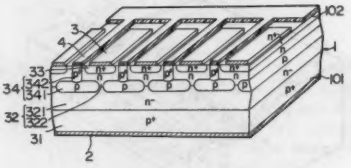
a Schottky barrier forming metal bonded to the entire wall of said hollow without filling said hollow, wherein said barrier metal is formed of an alloy of nickel-palladium to a thickness of 500 to 5000 Å.

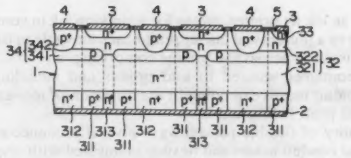
4,223,328

FIELD CONTROLLED THYRISTOR WITH DUAL RESISTIVITY FIELD LAYER

Yoshio Terasawa; Kenji Miyata, both of Katsuta; Masayoshi Naito, Hitachi; Takuzo Ogawa, Hitachi, and Masahiro Okamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 1, 1978, Ser. No. 911,311
Claims priority, application Japan, Jun. 8, 1977, 52-66648
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **11 Claims**





1. A three terminal FCT (field controlled thyristor) comprising

(a) a semiconductor substrate having a pair of opposite main surfaces and having a first conductivity type, said semiconductor substrate comprising

(1) a first emitter region having said first conductivity type and exposed in one of said main surfaces of said substrate,

(2) a second emitter region having a second conductivity type and exposed in the other main surface of said substrate, and

(3) a gate region having said second conductivity type, with at least a portion of said gate region exposed in said one main surface, said gate region having a slab-like portion formed between said first and second emitter regions and a part of which overlaps the projection of said first emitter region onto said other main surface;

(4) a first base region having said first conductivity type and adjacent to said second emitter region, and

(5) a second base region having said first conductivity type and a higher concentration of the impurity determining said first conductivity type and adjacent to said first emitter region;

(b) An electrode formed on said other surface of said substrate and electrodes connected respectively with the exposed portions of said first emitter region and said gate region, wherein the current path between the electrodes connected with said first and second emitter region includes a thyristor structure comprising said first emitter region, second base region, slab-like portion of said gate region, first base region and second emitter region, and said current is blocked by the depletion region formed in said substrate by the voltage applied between the elec-

trodes connected respectively with said first emitter region and said gate region.

4,223,329

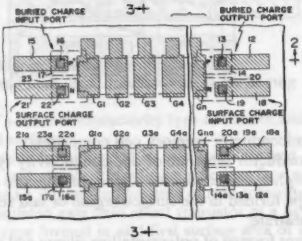
BIPOLAR DUAL-CHANNEL CHARGE-COUPLED DEVICE

Chakrapani G. Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,935

Int. Cl.³ H01L *29/78*; G11C *19/28*; H01L *27/04*

U.S. Cl. 357—24 **7 Claims**



1. A bipolar charge-coupled device structure comprising a semiconductor body, said body comprising a semiconductor layer of a first conductivity type having adjacent the surface thereof a series of electrodes,

means for electrically biasing said semiconductor layer at a potential to form a depletion region extending longitudinally within the semiconductor layer near the surface thereof,

means for applying voltages to the electrodes to provide adjacent each of a first plurality of said electrodes a respective first potential well at the surface of the semiconductor layer and forming a surface charge storage site for a charge packet of minority carriers of said semiconductor layer, and also adjacent each of a second plurality of said electrodes a second potential well buried within said depletion region and forming a buried charge storage site for a charge packet of majority carriers of said semiconductor layer,

minority carrier input means for serially transmitting charge packets of minority carriers to a first surface charge storage site adjacent one of said electrodes,

majority carrier input means for serially transmitting charge packets of majority carriers to a first buried charge storage site adjacent another of said electrodes,

minority carrier output means for serially transmitting from the device structure a first series of electrical output signals corresponding to a series of minority carrier charge packets transferred to said output means,

majority carrier output means for serially transmitting from the device structure a second series of electrical output signals corresponding to a series of majority carrier charge packets transferred to said last-recited output means, and

control clocking means for varying the voltages applied to the electrodes in timed sequence so as to displace said potential wells and the respective charge packets therein in a first serial stream along said surface from said first surface charge storage site to said minority carrier output means and also in a second serial stream buried within said depletion region from said first buried charge storage site to said majority carrier output means.

4,223,330

SOLID-STATE IMAGING DEVICE

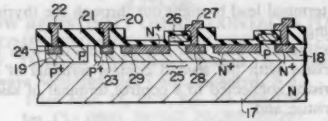
Norio Koike, Tokyo; Iwao Takemoto, Kodaira; Shinya Ohba, Kokubunji; Masaharu Kubo, Hachioji, and Shuhei Tanaka, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of, Japan

Filed Jan. 22, 1979, Ser. No. 5,567

Claims priority, application Japan, Jan. 23, 1978, 53-5224

Int. Cl.² H01L *27/14, 29/78*

U.S. Cl. 357—32 **12 Claims**



1. In a solid-state imaging device having, in one major surface portion of a semiconductor substrate of a first conductivity type, a plurality of photoelectric conversion elements which are disposed in a two dimensional array, a plurality of vertical switching metal-insulator-semiconductor field effect transistors and a plurality of horizontal switching metal-insulator-semiconductor field effect transistors for selectively establishing a connection to the photoelectric conversion elements, and vertical and horizontal scanning circuits which turn the switching transistors "on" and "off," a solid-state imaging device comprising

means for placing into a deeper cutoff state non-selected ones of the vertical switching metal-insulator-semiconductor field effect transistors, by placing at an accumulation level major surface regions of said semiconductor substrate underlying gate electrodes of said non-selected vertical switching metal-insulator-semiconductor field effect transistors.

4,223,331

THYRISTOR WITH TWO CONTROL TERMINALS AND CONTROL DEVICE

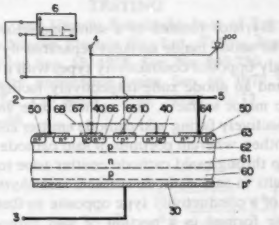
Elmar Müller, Alzey, and Klaus Weimann, Lampertheim, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 5, 1978, Ser. No. 922,098

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730612

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **3 Claims**



1. A new use for a first thyristor composed of a common-anode main and auxiliary thyristor combination integrated in a wafer-like semiconductor chip with at least four alternating zones of different conductivity types housed in a thyristor case, said thyristor having a first control electrode, said first thyristor having a first control terminal lead brought out through the thyristor case, said first control electrode contacting a small-area control zone recessed in an emitter zone and there being disposed in this recess and around the small-area control

zone a first annular zone which is at least as highly n-doped as the emitter zone and which is partially contacted by a second control electrode used as an auxiliary thyristor amplifying gate, said thyristor provided with a second control terminal contacting the second control electrode and brought out through the thyristor case, said first thyristor further having a portion of a p-doped base zone emerging at various places through the emitter zone to the chip surface and contacting shorted auxiliary cathode electrode connected to a cathode terminal, said portion of p-doped base zone also contacted by said second control electrode which is provided with a second control terminal lead brought out through the thyristor case, comprising:

connecting said first thyristor in a circuit with a second thyristor with the second control terminal of said first thyristor connected to a control terminal of said second thyristor; and

applying a control input from a control impulse source to the first control terminal of said first thyristor, thereby developing a positive voltage between the second control terminal and the shorted auxiliary cathode terminal of said first thyristor;

wherein the positive voltage developed on said second control terminal of said first thyristor is transferred to the control terminal of said second thyristor to generate an ignition current in said second thyristor, whereby said first and second thyristors are ignited.

4,223,332

THYRISTOR HAVING AN ANODE TRANSVERSE FIELD EMITTER

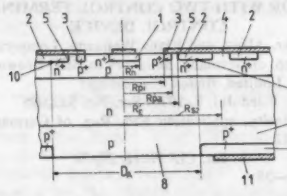
Roland Sittig, Umiken, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 11, 1978, Ser. No. 950,320

Claims priority, application Switzerland, Dec. 21, 1977, 15759/77

Int. Cl.[2] **H01L** *29/74*

U.S. Cl. 357—38 **8 Claims**



1. In a thyristor formed of a semiconductor body having cathode and anode major surfaces separated by four zones of alternatingly opposite conductivity type, with a cathode emitter zone and an anode zone respectively facing said cathode and anode major surfaces, and cathode base and anode base zones respectively facing said cathode emitter and anode zones and each other, wherein portions of said cathode base zone are brought up through said cathode emitter zone to form emitter short-circuits in said cathode surface, said thyristor having a gate zone of a conductivity type opposite to that of said cathode emitter formed in a portion of said cathode base zone brought up to said cathode surface, the improvement comprising:

said anode zone having a higher doped area and a lower doped area which are disposed facing said anode major surface, with the lower doped area opposite said gate zone such that the orthogonal projection of said lower doped zone to said cathode surfaces covers at least said gate zone; and,

said cathode emitter zone, said gate zone, and only said higher doped area of said anode zone coated with a metal electrode for making contact thereto.

4,223,333

CHARGE PUMPING SEMICONDUCTOR MEMORY

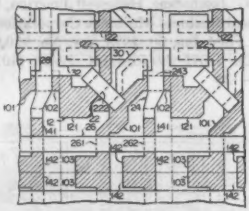
Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 25, 1978, Ser. No. 945,347

Claims priority, application Japan, Sep. 30, 1977, 52-117524

Int. Cl.[3] **H01L** *27/02, 29/04;* **H03K** *5/00;* **G11C** *11/34*

U.S. Cl. 357—41 **12 Claims**



1. A semiconductor memory cell comprising:

a semiconductor substrate of one conductivity type;

first to eighth semiconductor regions of opposite conductivity type formed in the surface region of said semiconductor substrate;

gate means formed of polycrystalline silicon and including a first gate electrode insulatively disposed at least in part above said first and second semiconductor regions to control electrical current flowing between said first and second semiconductor regions, a second gate electrode insulatively disposed at least in part above said third and fourth semiconductor regions to control electrical current flowing between said third and fourth semiconductor regions, and a third gate electrode insulatively disposed at least in part above said fifth to eighth semiconductor regions to control electrical current flowing between said fifth and sixth semiconductor regions and at the same time control electrical current flowing between said seventh and eighth semiconductor regions;

first and second capacitor electrodes formed of a polycrystalline silicon layer, said first capacitor electrode being insulatively disposed above a first part of said semiconductor substrate which lies adjacent to said first semiconductor region, and said second capacitor electrode being insulatively disposed above a second part of said semiconductor substrate which lies adjacent to said third semiconductor region;

first coupling means for electrically coupling said first and fifth semiconductor regions to said second gate electrode; and

second coupling means for electrically coupling said third and seventh semiconductor regions to said first gate electrode;

wherein said first and second semiconductor regions and said first gate electrode constitute a first driver transistor; said third and fourth semiconductor regions and said second gate electrode constitute a second driver transistor; said fifth and sixth semiconductor regions and said third gate electrode constitute a first address selection transistor; said seventh and eighth semiconductor regions and said third gate electrode consitute a second address selection transistor; said first part of the semiconductor substrate and said first capacitor electrode constitute a first load capacitor; and said second part of the semiconductor substrate and said second capacitor electrode constitute a second load capacitor and said first gate electrode and said first capacitor electrode are disposed to overlap each other insulatively and at least partly.

4,223,334

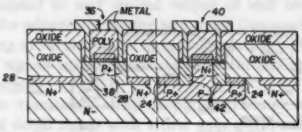
HIGH VOLTAGE CMOS WITH LOCAL OXIDATION FOR SELF-ALIGNED GUARD RINGS AND PROCESS OF FABRICATION

John T. Gasner, Melbourne, and Anthony L. Rivoli, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 835,263, Sep. 21, 1977. This application Aug. 29, 1978, Ser. No. 937,697

Int. Cl.[2] H01L 27/02

U.S. Cl. 357—42 2 Claims



1. An integrated circuit comprising:

a substrate of a first conductivity type having a surface region;

a well of a second conductivity type formed in said substrate at said surface;

an insulative layer formed in said substrate and extending above said surface for defining a first surface area of said well and a second surface area of said substrate;

a first insulated gate field effect transistor of a first conductivity type formed in said first surface area of said well;

a first guard ring of said second conductivity type formed in said well below said insulative layer;

a second insulated gate field effect transistor of a second conductivity type formed in said surface area of said substrate;

a second guard ring of said first conductivity type formed in said substrate below said insulative layer and spaced apart from said first guard ring; and

the top surface of said guard rings being vertically spaced from the top surface of the transistors by said insulative layers and the inner lateral edges of said guard rings being vertically aligned with outer lateral edges of a respective transistor.

4,223,335

SEMICONDUCTOR DEVICE BODY HAVING IDENTICAL ISOLATED COMPOSITE RESISTOR REGIONS

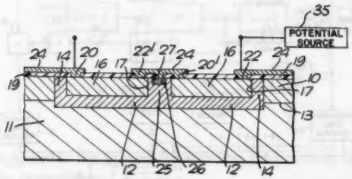
Jeffrey Kane, Cheadle Hulme, England, assignor to Ferranti Limited, Hollinwood, England

Continuation of Ser. No. 784,464, Apr. 4, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 18,985

Claims priority, application United Kingdom, Aug. 2, 1975, 32402/75

Int. Cl.[2] H01L 27/04, 29/12, 27/02

U.S. Cl. 357—48 4 Claims



1. A semiconductor device in a semiconductor body, the device comprising: a composite resistor comprising first and second resistor regions, an associated region of low resistivity material surrounding said resistor and forming with said composite resistor a P-N junction, said material having a resistivity less than that of said resistor, electrode means connected to one end of each of said first and second resistor regions and connected to said surrounding associated region, and a source of electrical potential of a given value is connected to the other end of one of said first and second resistor regions, whereby a potential of a fraction of said given value is applied by said electrode means to said surrounding region, said fraction selected to tend to reduce the effects of the resistance-voltage coefficients of said resistor.

4,223,336

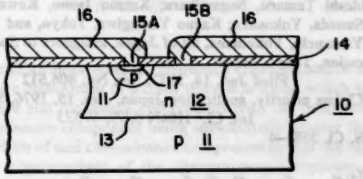
LOW RESISTIVITY OHMIC CONTACTS FOR COMPOUND SEMICONDUCTOR DEVICES

James W. Thompson, Whitehouse Station, N.J., assignor to Microwave Semiconductor Corp., Somerset, N.J.

Filed Mar. 14, 1978, Ser. No. 886,479

Int. Cl.[2] H01L 29/167, 29/207, 29/227

U.S. Cl. 357—63 8 Claims



1. An ohmic contact for providing non-rectifying contact with a body of a compound semiconductor material capable of accepting a plurality of different dopants at different respective sites, said contact comprising:

a layer of conductive material disposed in contact with said compound semiconductor body overlying a region of one type of conductivity;

disposed between said layer of conductive material and said region, an intervening layer doped substantially to saturation with each of a plurality of different dopants of the same conductivity type, said different dopants being suitable for occupying respectively different sites available in said compound semiconductor.

4,223,337

SEMICONDUCTOR INTEGRATED CIRCUIT WITH ELECTRODE PAD SUITED FOR A CHARACTERISTIC TESTING

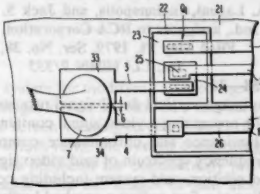
Hideto Kojima, and Hisashi Funakoshi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,730

Claims priority, application Japan, Sep. 16, 1977, 52-112064

Int. Cl.[2] H01L 23/48, 29/44, 29/52

U.S. Cl. 357—68 10 Claims



1. A semiconductor device comprising:

a semiconductor chip having a plurality of circuit elements formed therein;

a conductor layer formed on said semiconductor chip and interconnecting said circuit elements;

electrode pads connected to said conductor layer, at least one of said electrode pads including a plurality of separate parts, and said separate parts being connected to different circuit elements and disposed close to each other; said conductor layer and said circuit elements interconnected by said conductor layer forming a predetermined incomplete electrical circuit lacking a connection between said separate parts;

a package housing said semiconductor chip and having a plurality of external leads; and

means for electrically connecting said electrode pads with said external leads, one end of said electrically connecting means interconnecting said separate parts of said at least one electrode pad thereby completing said predetermined electrical circuit.

4,223,338

COLOR TELEVISION RECEIVER AND VTR SYSTEM

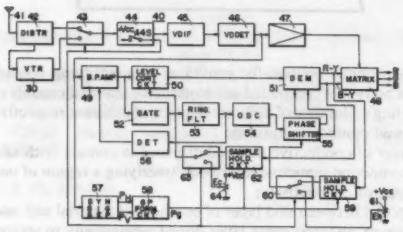
Hideshi Tamaru, Sagamihara; Katsuo Isono, Kawagoe; Seiji Sanada, Yokosuka; Kazuo Yamagiwa, Tokyo, and Toshiyuki Yamauchi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 14, 1977, Ser. No. 806,512

Claims priority, application Japan, Jun. 15, 1976, 51-70250

Int. Cl.[2] H04N *5/79, 9/535*

U.S. Cl. 358—4 **12 Claims**



1. A color television system comprising a video tape recorder, a color television receiver which includes an automatic control circuit for automatically controlling color level and/or hue with a reference signal contained in a predetermined horizontal scanning line section of a video signal, selective means for selectively applying a broadcasting signal and a reproduced signal of said video tape recorder to said color television receiver, and means rendering said automatic control circuit inoperative in response to a change-over operation of said selective means by which said color television system is changed over to apply the reproduced signal of said video tape recorder to said color television receiver.

4,223,339

VIDEO IMAGE VERTICAL DETAIL RESTORATION AND ENHANCEMENT

William A. Lagoni, Indianapolis, and Jack S. Fuhrer, Carmel, both of Ind., assignors to RCA Corporation, New York, N.Y.

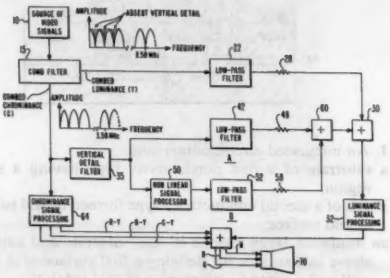
Filed May 11, 1979, Ser. No. 38,202

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—31 **4 Claims**

1. Video image vertical detail signal processing apparatus in a system for processing a video signal containing image representative luminance and chrominance components disposed within a frequency spectrum of said video signal in frequency interleaved relation, said system including comb filter means for providing at a first output a combed luminance signal with amplitude peaks at integral multiples of an image line scanning frequency and amplitude nulls at odd multiples of one-half said line frequency, and for providing at a second output a combed chrominance signal with amplitude peaks at odd multiples of one-half said line frequency and amplitude nulls at integral multiples of said line frequency, and wherein signals provided at said second output include signal frequencies representative of luminance vertical image detail information absent from said combed luminance signal at said first output, said apparatus comprising:

means coupled to said second output of said comb filter means for selectively passing said signal frequencies corresponding to vertical detail signal information, to the exclusion of signals occupying the band of chrominance signal frequencies;



means for translating small amplitude excursions of said vertical detail signal with a first gain greater than zero, and for translating moderate amplitude excursions of said vertical detail signal with a second gain greater than said first gain;

means for combining signals translated by said translating means with said combed luminance signal from said first output of said comb filter means to provide said luminance component; and

luminance signal utilization means for receiving said luminance component from said combining means.

4,223,340

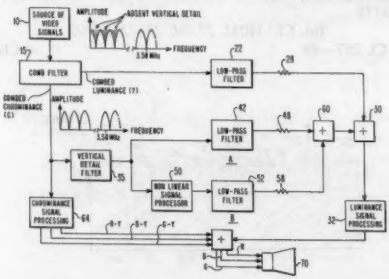
IMAGE DETAIL IMPROVEMENT IN A VERTICAL DETAIL ENHANCEMENT SYSTEM

Joseph P. Bingham, Carmel, and William A. Lagoni, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 11, 1979, Ser. No. 38,204

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—31 **5 Claims**



1. Video image vertical detail signal processing apparatus in a system for processing a video signal containing image representative luminance and chrominance components disposed with a frequency spectrum of said video signal in frequency interleaved relation, said system including comb filter means

for providing at a first output a combed luminance signal with amplitude peaks at integral multiples of an image line scanning frequency and amplitude nulls at odd multiples of one-half said line frequency, and for providing at a second output a combed chrominance signal with amplitude peaks at odd multiples of one-half said line frequency and amplitude nulls at integral multiples of said line frequency, and wherein signals provided at said second output include signal frequencies representative of luminance vertial image detail information absent from said combed luminance signal at said first output, said apparatus comprising:

means coupled to said second output of said comb filter means for selectively passing said signal frequencies corresponding to vertical detail signal information, to the exclusion of signals occupying the band of chrominance signal frequencies;

means for translating small amplitude excursions of said vertical detail signal with a first gain and for translating moderate amplitude excursions of said vertical detail signal with a second gain greater than said first gain, said translating means including a non-linear signal processor and low pass filter means for filtering output signals from said non-linear signal processor to remove signals occupying the band of frequencies above said vertical detail signal frequencies;

means for combining signals translated by said translating means with said combed luminance signal from said first output of said comb filter means to provide said luminance component; and

luminance signal utilization means for receiving said luminance component from said combining means.

4,223,341

CIRCUITRY PROVIDING A DELAYED COLOR TELEVISION SIGNAL HAVING LUMINANCE AND CHROMINANCE COMPONENTS DERIVED FROM ADJACENT LINES

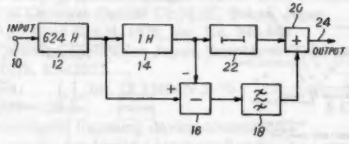
John O. Drewery, Coulsdon, England, assignor to British Broadcasting Corporation, of Broadcasting House, London, England

Continuation-in-part of Ser. No. 897,282, Apr. 17, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,239

Claims priority, application United Kingdom, May 26, 1978, 15810/78

Int. Cl.² H04N 9/535

U.S. Cl. 358—36 **32 Claims**



1. Apparatus for processing 625-line PAL colour television signals, comprising:

means for providing in conjunction with each line of the signal an additional signal for use therewith, said additional signal comprising the luminance component derived from the signal 625 lines previous to the current line, and the chrominance component derived from the signal 624 lines previous to the current line.

4,223,342

CIRCUIT FOR IMPROVING THE FREQUENCY CHARACTERISTIC OF A COLOR TELEVISION SIGNAL

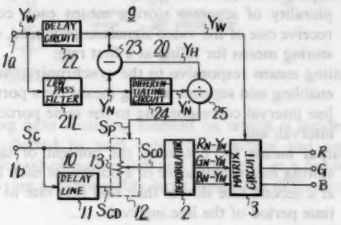
Takao Tsuchiya, Fujisawa; Takashi Okada, Yokohama; Yoshio Ishigaki, Tokyo, and Shouji Omori, Tachikawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1978, Ser. No. 966,737

Claims priority, application Japan, Dec. 19, 1977, 52-152610

Int. Cl.² H04N 5/14

U.S. Cl. 358—37 **10 Claims**



1. A circuit for improving the frequency characteristic of the chrominance component of a color television signal which has chrominance and luminance components with the bandwidth of said luminance component being substantially greater than the bandwidth of said chrominance component so that the high frequency characteristic of the chrominance component is relatively degraded, comprising:

generating means for generating a control signal which varies in response to a difference in characteristics of two frequency regions of said luminance component; and

means for selectively advancing and retarding the phase of said chrominance component relative to the phase of said luminance component, in response to said control signal.

4,223,343

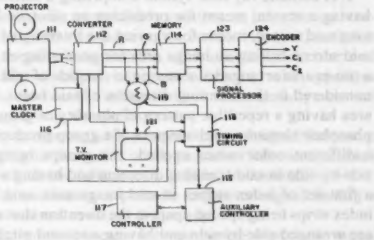
ARRANGEMENTS FOR MODIFYING SIGNALS INDICATIVE OF ANAMORPHIC IMAGES

Armand Belmares-Sarabia, 161 Mills Pond Rd., St. James, N.Y. 11780, and Stanley J. Chayka, 16 Dunnellen Rd., Parsippany, N.J. 07054

Filed Nov. 10, 1977, Ser. No. 850,459

Int. Cl.² H04N 3/36, 3/22

U.S. Cl. 358—54 **10 Claims**



1. A real-time system for modifying a video signal indicative of anamorphic images stored in color on a motion picture film suitable for wide screen viewing having frames of a predetermined height to width ratio, the system comprising:

a motion picture projector for continuously providing illuminated images from the images of said motion picture film, said illuminated images having the same predetermined height to width ratio, wherein the dimensions of the images in the horizontal direction are compressed relative to the dimensions in the vertical direction;

transducing means for continuously responding to said illuminated images and for producing a representative video signal including line, field and frame intervals and associated horizontal and vertical synchronization signals and a reference signal, said transducing means including means for splitting the color image into spectral components and a plurality of photo-voltaic means each having a photosensitivity responsive to one of the spectral components of colored television transmission signals and for producing a representative video signal;

a plurality of separate storing means each connected to receive one of the video signals as produced, each of said storing means for filling at a first rate;

gating means responsive to the synchronization signals for enabling said separate storing means for a portion of each line interval corresponding to the same portion of a field interval; and

output means for obtaining the content of said separate storing means indicative of a portion of each line interval at a second rate slower than said first rate to occupy the time period of the line interval.

4,223,344

BEAM INDEX COLOR CATHODE RAY TUBE

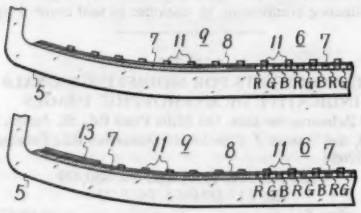
Takashi Hosono, Yokohama; Akio Ohkoshi, Tokyo; Takashi Tooyama, Kokubunji; Akira Tooyama, and Takahiro Yukawa, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1978, Ser. No. 969,975

Claims priority, application Japan, Dec. 21, 1977, 52-154067; Dec. 24, 1977, 52-155884

Int. Cl.[2] H04N 9/24

U.S. Cl. 358—67 **28 Claims**



1. A cathode ray tube system comprising a cathode ray tube having a screen, means for producing an electron beam scanning said screen, means for varying the intensity of said beam, said screen having an image area for generating an image and a run-in area arranged at a margin to one side of said image area considered in the scanning direction of said beam, said image area having a repetitive pattern of plurality of groups of color phosphor elements, each element of a group producing light of a different color when excited, the groups being arranged side-by-side in said scanning direction and having a first pitch, a first set of index stripes in said image area, said first set of index strips being spaced apart in the direction that said groups are arranged side-by-side and having a second pitch, said run-in area having a second set of index stripes parallel to said first set of index stripes and having said second pitch at least between said index stripes of the second set adjacent said margin of the image area, means for generating index signal pulses in response to said electron beam scanning over said second set of index stripes and then over said first set of index stripes, means responsive to counting of a predetermined number of said index signal pulses resulting from scanning of the index stripes in said second set of synchronize the time-phase position of said means for varying the intensity of the beam at the beginning of scanning of said image area by said electron beam.

4,223,345

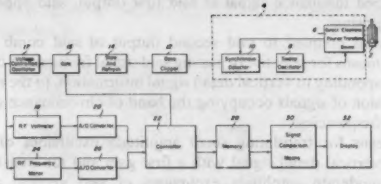
METHOD AND APPARATUS FOR CAMOUFLAGE SIGNATURE MEASUREMENT

Joseph F. Hannigan, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 20, 1979, Ser. No. 50,391

Int. Cl.[3] H04N 7/18

U.S. Cl. 358—93 **8 Claims**



1. Apparatus for measuring the extent of camouflage applied to a target, comprising

(a) means responsive to first and second conditions of camouflage of a target for producing spectra signals of first and second limited Fourier transforms, respectively, each of said spectra signals having a plurality of amplitude and principal frequency components;

(b) base clipper circuit means for deleting from said spectra signals those amplitude components having amplitudes less than a given value;

(c) means connected with said clipper circuit means for producing amplitude and principal frequency digital signals corresponding with the clipped amplitude and principal frequency components of said first and second spectra signals, respectively; and

(d) comparison means connected with said digital signal producing means for comparing said first and second amplitude signals at each of said principal frequencies, thereby to indicate the difference between the extent of camouflage of the target in said first and second conditions.

4,223,346

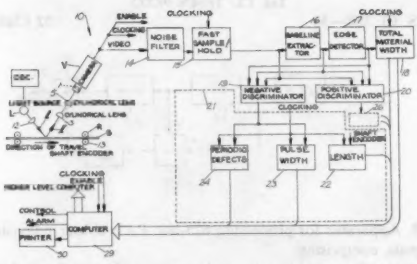
AUTOMATIC DEFECT DETECTING INSPECTION APPARATUS

Gary L. Neiheisel, Cincinnati, and Bradley R. Hoover, Hamilton, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Apr. 5, 1979, Ser. No. 27,320

Int. Cl.[2] H04N 5/72, 7/18

U.S. Cl. 358—106 **8 Claims**



1. Automatic defect detecting apparatus for inspecting and detecting defects on the surface of a moving sheet of material, said defects having a visual appearance different from the remainder of said sheet surface, said apparatus comprising a light source for illuminating a selected portion of said sheet

surface, means for scanning said selected portion of said sheet in a direction transverse to the direction of sheet movement to produce an output video signal corresponding to the optical intensity of the area scanned, means for processing said output video signal to produce information characterizing the nature of the optical intensity of said area scanned, and optical means positioned between the moving sheet of material and said scanning means for increasing the sensitivity of said scanning means in the direction of material movement while maintaining the sensitivity of said scanning means substantially unchanged in the direction transverse to material movement.

4,223,347

VIDEODISC WITH UNDULATING NESTED TRACKS

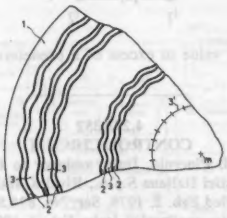
Gijsbertus Bouwhuis, and Pieter Kramer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,396

Claims priority, application Netherlands, Oct. 17, 1973, 7314267

Int. Cl.² A04N 5/76

U.S. Cl. 358—128.5 **4 Claims**



1. A record carrier on which information corresponding to a television program is stored in an optically readable structure in the form of first areas alternating with second areas along tracks with lands between successive tracks, said first areas having a different effect on impinging radiation than the second areas and the lands between the tracks, the improvement wherein the track portions, viewed in a direction transverse to the direction in which the tracks are read, are provided with periodic excursions towards and away from adjacent tracks corresponding to line synchronization pulses in said television program, the period of said excursions being substantially greater than the average period of the areas in the tracks and the amplitude of said excursions being smaller than the track width.

4,223,348

AUTOMATIC FOCUSSING DEVICE

Kenichi Oinoue, and Shohei Nagai, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,660

Claims priority, application Japan, Sep. 12, 1977, 52-108908; Apr. 12, 1978, 53-42077

Int. Cl.² H04N 5/76

U.S. Cl. 358—128.5 **5 Claims**

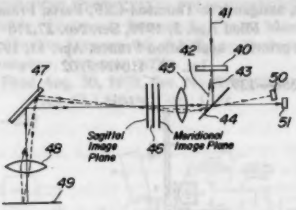
1. An automatic focussing device comprising

a hologram for producing a luminous flux having a considerably large astigmatism with or without coma;

a relay lens for converging said luminous flux with an astigmatic difference Δl and having an optimum image forming plane;

a video disc surface to be recorded or reproduced;

an objective lens arranged between said optimum image forming plane and said video disc surface and converging said luminous flux as a focussing luminous flux with a small astigmatic difference onto said video disc surface, said optimum image forming surface and said video disc surface being conjugate in position with respect to said objective lens; and



a focussing light receiving element on which is incident a light reflected by said video disc surface and passed through said objective lens and relay lens as a luminous flux having a considerably large astigmatic difference.

4,223,349

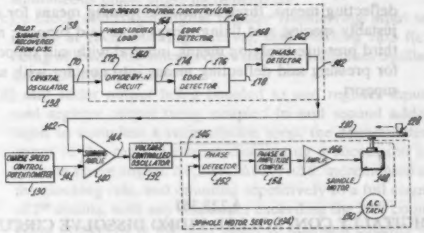
SYSTEM FOR ROTATING AN INFORMATION STORAGE DISC AT A VARIABLE ANGULAR VELOCITY TO RECOVER INFORMATION THEREFROM AT A PRESCRIBED CONSTANT RATE

Wayne R. Dakin, Redondo Beach, and Ludwig Ceshkovsky, Fountain Valley, both of Calif., assignors to MCA Discovision, Inc., Universal City, Calif.

Filed Nov. 16, 1978, Ser. No. 961,404

Int. Cl.² G11B 19/24

U.S. Cl. 358—128.5 **26 Claims**



17. Apparatus for controllably rotating an information storage disc relative to a transducer, to recover information that is stored on the disc in a plurality of substantially circular and concentrically arranged information tracks, said apparatus operating to recover the information at a substantially constant rate, said apparatus comprising:

means for producing a coarse speed control signal that varies according to the radius of the particular information track from which the information is being recovered;

means for producing a periodic reference signal having a predetermined constant frequency;

fine speed control means for comparing a periodic signal included in the information recovered from the disc with the periodic reference signal, and for producing a corresponding fine speed control signal representative of the comparison;

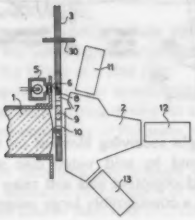
means, responsive to the coarse speed control signal and the fine speed control signal, for producing a composite speed control signal representative of the prescribed angular velocity at which the disc is to be rotated; and

means, responsive to the composite speed control signal, for rotating the disc at the prescribed angular velocity, whereby the information stored thereon is recovered by the transducer at the prescribed constant rate.

4,223,350
DIASCOPE FOR A TELEVISION CAMERA

Louis Moutet, and Jean-Marc Moenne-Loccoz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 5, 1979, Ser. No. 27,276
Claims priority, application France, Apr. 11, 1978, 78 10612
Int. Cl.[2] H04N 7/02
U.S. Cl. 358—139 5 Claims



1. Diascope for a television camera designed in such a way as to enable optical adjustments and comprising for this purpose:

a support in which is provided a rectilinear slot having a cross-section which flares from the bottom to the top,

a slide holder, an objective lens and deflecting means for deflecting light rays,

first and second pressure-applying means integral with said support, for pressing said slide holder and said objective lens respectively into said rectilinear slot,

connecting means for connecting said deflecting means and said support comprising: fixing means integral with said deflecting means; three adjustable spacing means for adjustably spacing said fixing means from said support; and third pressure-applying means, integral with said support, for pressing said deflecting means into contact with said support.

4,223,351
DIGITALLY CONTROLLED VIDEO DISSOLVE CIRCUIT

Katsuhito Tsujimura, Machida, Japan; Louis Moutet, and Jean-Marc Moenne-Loccoz, both of Paris, France, assignors to Sony Corporation, Tokyo, Japan and Thomson-CSF, Paris, France

Filed May 23, 1978, Ser. No. 908,770
Claims priority, application Japan, May 24, 1977, 52-59305
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—182 14 Claims

1. A video signal processing circuit for producing a dissolve signal to control dissolving of a video signal by control of the amplitude of said video signal in a gain control circuit which is controlled in response to a control signal, said video signal processing circuit comprising:

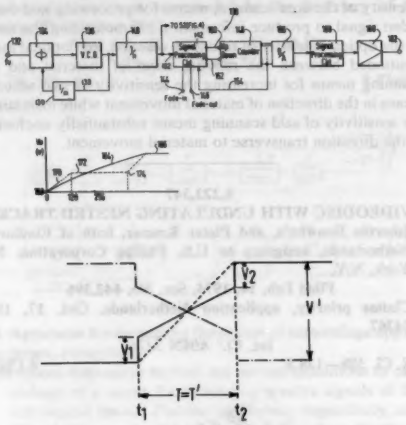
means for generating a clock signal having a frequency which is synchronous with a vertical synchronizing signal of said video signal;

means for frequency-dividing said clock signal by a preset value n;

means for counting said frequency-dividing clock signal during at least one vertical period of said video signal;

means for converting the digital output of said counting means into a corresponding analogue signal, whereby said analogue signal is supplied to said gain control circuit as said gain control signal; and

first signal processing means connected between said frequency-dividing means and said counting means for preventing the supply of said clock signals during a predetermined interval, when the dissolve duration in said circuit

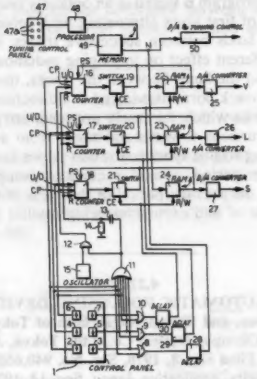


is set at a value in excess of a predetermined period of time.

4,223,352
CONTROL CIRCUIT

Pietro Belisomi, Pinerolo, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta, Italy

Filed Feb. 2, 1978, Ser. No. 874,598
Claims priority, application Italy, Feb. 2, 1977, 67219 A/77
Int. Cl.[3] H04N 5/24, 5/44; H04B 1/06
U.S. Cl. 358—185 15 Claims



1. In a circuit device for carrying out and memorising adjustments to the tuning of a television receiver for a plurality of transmitter stations, of the type incorporating tuner memory means for memorising the value of control signals determining the tuning of the receiver,

the improvement wherein:

said tuner memory means are also operable to produce an output signal characteristic of the station to which the receiver is tuned,

there are provided further memory means and

there are further provided means for feeding said output signal from said tuner memory means which is characteristic of the station to which the receiver is tuned as an address signal to said further memory means,

said further memory means storing signals determining the adjustment to at least one of the controls of said receiver other than the tuning control for every station to which the receiver can be tuned,

means for effecting adjustment of this control of said receiver automatically in dependence on said stored signals in said further memory means when the tuning of said receiver is changed to select a different station, and

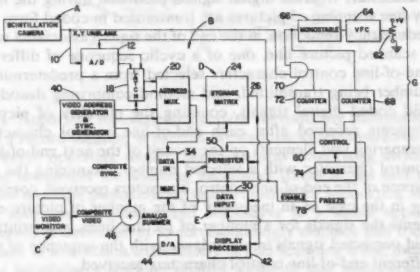
means for selectively changing the signals stored at any one address in said further memory means whereby to change the adjustment to said one control of said television receiver in respect of any one station.

4,223,353

VARIABLE PERSISTANCE VIDEO DISPLAY

John T. Keller, Willoughby, and Robert H. Wake, Solon, both of Ohio, assignors to Ohio Nuclear Inc., Solon, Ohio

Filed Nov. 6, 1978, Ser. No. 958,131
Int. Cl.[2] H04N *5/66*
U.S. Cl. 358—230 **29 Claims**



1. A video display apparatus comprising:

a circuit for causing a persistence scope-like display on a video monitor including a storage means having a plurality of addresses able to store values of a plurality of magnitudes for each address and means operatively connected with said storge means for progressively altering over a plurality of video frames the value stored at each storage address as a function of time; and

a video monitor operatively connected to said storage means for displaying in successive video frames the magnitudes of the values currently stored at each storage address.

27. The method of examining a patient with a radioisotope injected into its blood with a scintillation camera positioned over the region of the patient to be examined comprising the steps of:

(a) producing a coordinate signal representing the coordinate position of radiation received by the scintillation camera;

(b) transforming the coordinate signal into a memory address and addressing a memory;

(c) passing a value stored at the memory address out of the memory;

(d) modifying the passed value and returning the modified value to the memory address;

(e) serially addressing a plurality of memory addresses and passing the value stored at each memory address out of the memory;

(f) altering each serially addressed value and returning the altered value to the corresponding address in the memory; and

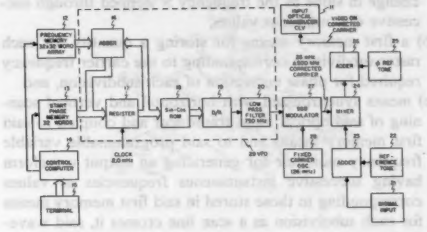
(g) serially displaying the values on a video monitor to produce a visual display representing radiation receipt at various coordinate positions of the scintillation camera.

4,223,354

PHASE CORRECTED RASTER SCANNED LIGHT MODULATOR AND A VARIABLE FREQUENCY OSCILLATOR FOR EFFECTING PHASE CORRECTION

Milton L. Noble, Liverpool; Samuel E. Craig, Manlius, and William G. Hoefer, Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,150
Int. Cl.[2] H04N *5/66, 5/74*
U.S. Cl. 358—233 **9 Claims**



1. A variable frequency oscillator for generating an output waveform which is continuous and without discontinuous change in slope as the frequency is stepped through successive discontinuous values, comprising:

(a) a clocked digital adder having a first and a second input and an output,

(b) first memory means for applying an input quantity to said first adder for recurrent addition at the clocking interval, said input quantitiy being proportional to the desired instantaneous output frequency f(o) and denoting an instantaneous phase angle increment, $\Delta\theta$,

(c) a clock controlled digital register transferring input to output at each clocking interval, said clocking rate f(c) being at least four times greater than the maximum oscillator ouptut frequency,

(d) said adder output being coupled to said register input, said register output being coupled to said second adder input to complete a recirculation loop, the accumulated count in the register output designating a succession of discrete phase angles, $\Delta\theta, 2\Delta\theta, 3\Delta\theta \ldots n\Delta\theta$, incremented at the clocking rate, and counting repetitively to a full count of 2^m counts, with any remainder exceeding the 2^{mth} count being preserved in the next count to maintain equality in angular incrementation,

(e) a digital read only memory coupled to the output of said register and producing output values which are a sine (or cosine) function of said discrete input angles in angular increments which are multiples of $2\pi(\frac{1}{4})^m$ radians, 2^m input counts corresponding to 2π radians, and m being selected to be large enough to provide the desired frequency resoltuion,

(f) a first digital to analog converter coupled to the output of said read only memory for converting said discrete digital values into discrete analog sine (or cosine) values, and

(g) a low pass filter coupled to the output of said first digital to analog converter having a high frequency cut off adjusted to synthesize a sustained waveform from said discrete analog values at an output frequency f(o):

$$f_{(o)} = \frac{\Delta\theta}{2\pi} f(c)$$

where $\Delta\theta$ is the phase angle increment measured in radians and

f(c) is the clocking rate,

said sustained output waveform assuming successive sine or cosine values.

8. A phase corrected, raster scanned light modulator in which information modulated on a carrier is used to form a

grating whose spatial frequency along the scanning line varies in accordance with the signal modulation frequency, and whose spatial frequency from line to line is constant, said light modulator being subject to phase errors which vary smoothly over the raster and which permit partitioning said raster into a plurality of rectangular subdivisions each associated with a predetermined phase error, comprising:

(a) a programmable variable frequency oscillator for generating said carrier, said oscillator having an output waveform which is continuous and without discontinuous change in slope as the frequency is stepped through successive discontinuous values,

(b) a first memory means for storing a quantity for each raster subdivision corresponding to the carrier frequency required for phase correction of each subdivision, and

(c) means synchronized with horizontal and vertical scanning of said optical input transducer and coupled to said first memory means and to said programmable variable frequency oscillator for generating an output waveform having successive instantaneous frequencies at values corresponding to those stored in said first memory means for each subdivision as a scan line crosses it, said waveform maintaining continuity until the scan line is complete, and repeating the process through successive scan lines until scanning of the raster is complete.

4,223,355

TELEVISION CAMERA

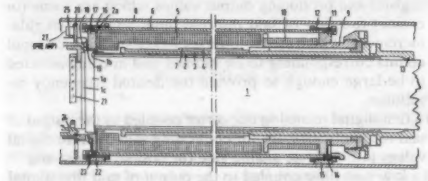
Joachim Lerch, Leopoldshafen, and Gerhard Seitz, Karlsruhe, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,102

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738852

Int. Cl.² H04N *5/30*

U.S. Cl. 358—248 **10 Claims**



1. In a television camera including:

(a) a pickup tube of the vidicon type with deflection coils surrounding the tube;

(b) a focusing coil, wound in self-supporting manner, disposed thereover;

(c) a cylinder enclosing the coils for magnetic shielding, the improvement comprising:

(d) the outside diameter of the focusing coil being approximately equal to the inside diameter of the magnetic shielding cylinder; and

(e) a conductive adhesive connecting the focusing coil to the shielding cylinder in a heat conducting manner.

4,223,356

METHOD AND ARRANGEMENT FOR FACSIMILE PICTURE TRANSMISSION

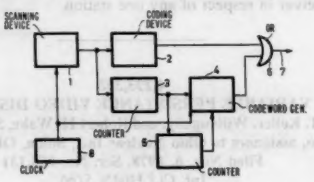
Gerhard Renelt, Hamburg, and Ulf Rothgordt, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1978, Ser. No. 884,127

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711377

Int. Cl.² H04N *1/00*; H03K *5/18*

U.S. Cl. 358—261 **10 Claims**



1. A method of facsimile picture reception for use with a transmitter, wherein digital signals produced during the line-by-line scanning of pictures are transmitted in coded form for redundancy-reduction, at the end of the signals associated with a scanned picture line, one of a cyclic sequence of different end-of-line control characters selected from a predetermined number being transmitted, said method comprising decoding said coded digital signals, counting the plurality of picture elements received after each end-of-line control character, comparing said elements on the receipt of the next end-of-line control character with a selected number, examining the sequence of the end-of-line control characters received, correcting in the case of an inequality of the number of picture elements the signals for a number of picture lines, and printing said corrected signals in accordance with the sequence of the different end-of-line control characters received.

4,223,357

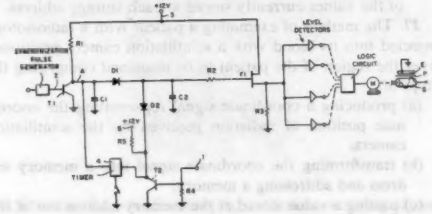
FACSIMILE RECORDER WITH SWEEP RATE DETECTION

Gerald L. Vano, Brockton, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Oct. 23, 1978, Ser. No. 953,468

Int. Cl.² H04N *1/36*

U.S. Cl. 358—264 **14 Claims**



1. In a facsimile recorder of electrical signals including means for receiving a series of control pulses occurring at one of several regular intervals, and graphic information for recording on a web, the recorder including a scanning electrode effectively traversing the paper and means to drive the electrode at various speeds, a control circuit comprising:

a first voltage storage means;

means for charging the storage means;

switch means responsive to a received control pulse to discharge the storage means after a voltage rise thereon dependent on the interval between control pulses; and

control means coupled to the storage means for sensing the maximum voltage rise thereon and controlling the scanning electrode drive means to drive the electrode at a speed proportional to the frequency of the control pulses, including means converting the maximum voltage rise to a control signal selecting the scanning electrode driving speed.

4,223,358

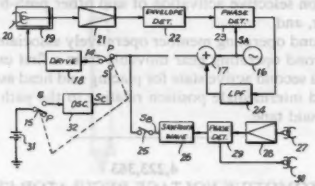
METHOD AND APPARATUS FOR CANCELLING THE REMANENT DEFLECTION IN A PIEZOCERAMIC HEAD SUPPORT MEANS OF A VIDEO RECORDER

Yukio Kubota, Tokyo; Keiko Noji, Kawasaki, and Yoshimi Watanabe, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,765

Int. Cl.[2] G11B *21/02, 21/10*

U.S. Cl. 360—75 **20 Claims**



1. Apparatus for recording and/or reproducing information on a record medium in parallel skewed tracks and operative in selected operating modes, said apparatus comprising at least one transducer for scanning successive traces across said record medium; piezoceramic support means for supporting said at least one transducer and responsive to a signal applied thereto to deflect so as to correspondingly displace said transducer in a direction transversely of said scanning trace; means for supplying a tracking control signal to said piezoceramic support means during selected operating modes; a source of oscillating signal of magnitude substantially greater than the magnitude of said tracking control signal; and means responsive to a change-over between selected operating modes of said apparatus for supplying said oscillating signal to said piezoceramic support means for a predetermined duration during which the magnitude of said oscillating signal gradually reduces from a maximum amplitude to a minimum amplitude.

4,223,359

FLEXIBLE MAGNETIC DISK RECORDING APPARATUS

Alighiero Galvagni, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 27, 1978, Ser. No. 881,656

Claims priority, application Italy, Mar. 4, 1977, 67478 A/77

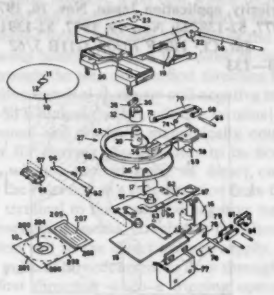
Int. Cl.[3] G11B *17/00, 19/28, 15/46, 5/82*

U.S. Cl. 360—99 **12 Claims**

1. An apparatus for recording and/or reproducing binary information on a flexible magnetic disk having a magnetizable surface carrying a spiral track whereon said information is storable, said apparatus comprising:

a rotating drive hub cooperative with said disk for rotation therewith, a plate connected to said hub for rotation therewith, said plate having a first surface carrying a first spiral guide associated with said spiral track and a second surface, opposite to said first surface, carrying a second spiral guide,

a magnetic head assembly for recording and/or reproducing said information on said disk, said head assembly comprising first and second spaced arms between which said plate is located, a first element carried by said first arm, said first element normally in engagement with said first spiral guide to move said head from the periphery towards the center of said disk synchronously with the rotation thereof to follow the spiral track of said disk during the rotation of said plate, and a second element carried by said second arm and engageable with said second spiral guide for returning said head towards the periphery of said disk during the rotation of said plate, and



means for alternately bringing said first element or said second element respectively into contact with said first spiral guide or with said second spiral guide.

4,223,360

MAGNETIC RECORDING TRANSDUCERS

David J. Sansom, Ottershaw, and Derek F. Case, Sunbury-on-Thames, both of England, assignors to Data Recording Instrument Company, Ltd., Staines, England

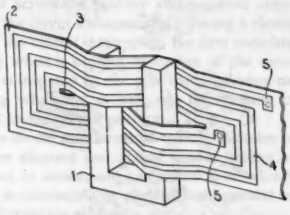
Filed Apr. 1, 1974, Ser. No. 456,828

Claims priority, application United Kingdom, Apr. 13, 1973, 17863/73

The portion of the term of this patent subsequent to Feb. 9, 1993, has been disclaimed.

Int. Cl.[2] G11B *5/20*; H01F *7/06, 27/28*

U.S. Cl. 360—123 **5 Claims**



1. A core and coil assembly for a magnetic transducing head, which assembly includes a core having two aligned self-supporting limbs; a substrate formed of sheet material and having two opposed internal edges defining a longitudinal opening; and a multi-turn conductive spiral carried on one face of said substrate and surrounding the said longitudinal opening; the region of said substrate bounded by one of said internal edges being bowed in one sense and the region of the said substrate bounded by the other of the said internal edges being bowed in the opposite sense; and the substrate being supported on at least one of the said limbs with the said one limb extending through the said opening and engaging both said bowed regions; the said multi-turn spiral thereby forming a multi-turn coil about the said core.

4,223,361

MAGNETIC RECORDING MEDIUM

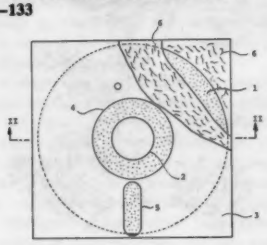
Hiroshi Zaitsu; Takashi Yamase, both of Takatsuki; Sadao Yamashita, Kyoto, and Kunio Mizushima, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 16, 1978, Ser. No. 961,279

Claims priority, application Japan, Nov. 16, 1977, 52-138222; Nov. 16, 1977, 52-138223; Nov. 19, 1977, 52-139131

Int. Cl.[2] H01F *10/02;* **G11B** *5/62*

U.S. Cl. 360—133 **13 Claims**



1. A magnetic recording medium which comprises a substrate and a magnetic layer of about 1.0 to 10μ in thickness comprising magnetic powders and a binder being formed on the substrate, characterized in that the magnetic layer further comprises a liquid hydrocarbon selected from the group consisting of liquid paraffin, squalane, α-olefin and polymerized oil and having a melting or flowing point of about −20° to 60° C. with a higher fatty acid having a melting point of about 45° C. or higher.

4,223,362

TAPE RECORDING AND/OR REPRODUCING APPARATUS

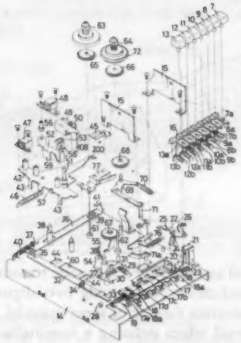
Yoshio Kishi, Hachiouji, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,010

Claims priority, application Japan, Aug. 22, 1977, 52-100761

Int. Cl.[2] G11B *15/02, 19/02*

U.S. Cl. 360—137 **16 Claims**



1. A tape recording and/or reproducing apparatus comprising:

a push-button assembly including a plurality of push-button members for selectively placing said apparatus into a selected one of a plurality of operating modes,

a head assembly including at least a recording and/or reproducing head, movable from a first inactive position through an intermediate position to a second active position in close juxtaposition to a magnetic tape which is adapted to have information signals reproduced from or recorded on the tape by said head,

a tape drive assembly including a pinch roller and tape drive capstan for selectively driving the tape at a predetermined speed for tape recording or reproducing and at a higher speed for winding the tape when no recording or reproducing function occurs,

a first operating gear operatively associated with at least one of said plurality of push-button members through a first trigger means wherein said first trigger means responds upon selective activation of said one push-button member,

a first operating member operatively associated with said first operating gear movable from a first inactive state to a second active state for placing said tape drive assembly into an active state to drive tape at one of said tape drive speeds,

a second operating gear operatively associated with at least another of said push-button members through a second trigger means wherein said second trigger means responds upon selective activation of said other push-button member, and

a second operating member operatively associated with said second operating gear movable from a first inactive state to a second active state for placing said head assembly into said intermediate position relative to the path of running of said tape.

4,223,363

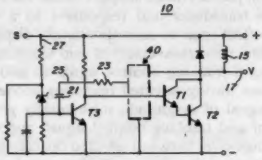
AUTOMOTIVE VOLTAGE REGULATOR SYSTEM

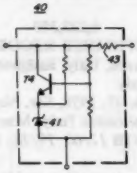
Dean C. Santis, Winfield, and Kirk Sievers, Roselle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 24, 1978, Ser. No. 963,250

Int. Cl.[3] H02H *7/06*

U.S. Cl. 361—18 **10 Claims**





1. An automotive battery charging system having a voltage regulator circuit with an improved feedback network comprising:

first circuit means for sensing voltage across a battery and generating a DC current in a field coil of an alternator charging system,

second circuit means including switching means and a feedback network for controlling the duty cycle and frequency of current in said field coil by switching in response to the voltage of said first circuit means,

filter means coupled between said feedback network and said field coil for preventing voltage spikes and ripple occurring at said switching means from effecting normal operation of said second circuit means.

4,223,364

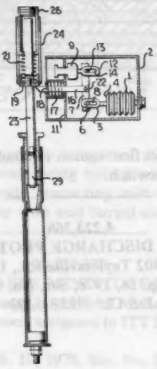
PRESSURE AND TEMPERATURE RESPONSIVE PROTECTIVE DEVICES

Harold L. Sangster, Rte. #1, Box 55A, Shepherdstown, W. Va. 25443

Continuation-in-part of Ser. No. 826,648, Aug. 22, 1977, abandoned. This application May 25, 1978, Ser. No. 909,454

Int. Cl.³ H02H *5/06, 5/08, 7/04*

U.S. Cl. 361—37 **17 Claims**



1. A protection device comprising

first sensor means producing a response to temperature which varies as a predetermined function of temperature,

second sensor means producing a response to pressure which varies as a predeterminable function of pressure,

a control means,

means for setting said control means in a first control condition,

said control means establishing a first electrical circuit condition when in said first control condition and establishing a second electrical circuit condition when in a second control condition,

means for changing said control means from said first to said second condition upon detection of a predetermined condition,

said condition being a function of the responses of said means for sensing over a continuous range from a minimum predetermined temperature and a maximum pressure to a minimum predetermined pressure to a maximum predetermined temperature.

4,223,365

AUTO RESETTING SWITCHGEAR TRIP INDICATOR CIRCUITS

Richard J. Moran, Milwaukee, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 29, 1979, Ser. No. 25,107

Int. Cl.³ H02H *3/04, 3/06*

U.S. Cl. 361—71 **9 Claims**

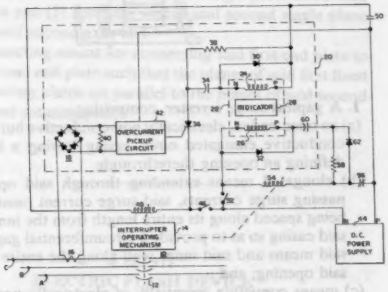
1. An automatically-reset, trip indicator for a circuit interrupter of an alternating electric system, wherein the circuit interrupter includes at least one pair of separable current interrupting contacts disposed in one phase circuit of the alternating electric system, interrupter closing means for closing the circuit interrupter by moving at least one interrupting contact of said at least one pair of interrupting contacts into a closed position at which the two interrupting contacts of said at least one pair of interrupting contacts are electrically engaged, an interrupter tripping means for tripping the circuit interrupter by moving said at least one interrupting contact of said at least one pair of interrupting contacts into an opened position at which the two interrupting contacts of said at least one pair of interrupting contacts are disengaged and spaced apart, and wherein the trip indicator comprises:

a direct voltage supply, having a positive output terminal and a negative output terminal;

an electromagnetic status indicator, including an indicator which is movable between an indicating position and a non-indicating position, a set coil which includes a positive terminal and a negative terminal and which is magnetically coupled to the indicator for moving the indicator to its indicating position when a first pulse of direct current flows through the set coil in a first direction from the set coil positive terminal to the set coil negative terminal, and a reset coil which includes a positive terminal and a negative terminal and which is magnetically coupled to the indicator for moving the indicator to its non-indicating position when a second pulse of direct current flows through the reset coil in a first direction from the reset coil positive terminal to the reset coil negative terminal;

a set coil energizing means, coupled to the alternating electric system and to the direct voltage supply, for causing the first pulse of direct current to flow through the set coil in the first direction when a tripping operation of the circuit interrupter is initiated at the same time that a particular abnormal condition exists in the alternating electric system;

a reset coil energizing means, which includes a first resistive element,



a first switching means for connecting the first resistive element across the positive and negative output terminals of the direct voltage supply during a closing operation of the circuit interrupter, the first switching means closing when a closing operation of the circuit interrupter is initiated by the interrupter closing means and opening when the at least one interrupting contact is moved to the closed position,

a resistor-diode combination which includes a second resistive element and a first diode, having a positive terminal, or anode, and a negative terminal, or cathode, which is connected in parallel arrangement across the second resistive element,

a coil-diode combination which includes the reset coil and a second diode, having a positive terminal connected to the reset coil negative terminal and a negative terminal connected to the reset coil positive terminal, and

a first capacitor, which is connected in series arrangement with the resistor-diode combination and the coil-diode combination across the first resistive element such that, when the first switching means closes to connect the first resistive element across the positive and negative output terminals of the direct voltage supply, the second pulse of current will flow through the first capacitor, through the first diode of the resistor-diode combination in a forward direction from the positive terminal to the negative terminal of the first diode, and through the reset coil of the coil-diode combination in the first

direction until the first capacitor is fully charged, and when the first switching means opens to disconnect the first switching means from the direct voltage supply, the first capacitor will discharge through the first resistive element, the second resistive element of the resistor diode combination, and the second diode of the coil-diode combination.

4,223,366

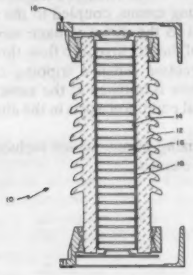
GAPLESS SURGE ARRESTER

Andrew S. Sweetana, Jr., Bloomington, Ind.; Tapan K. Gupta, Monroeville; Richard E. Kothmann, Pittsburgh, both of Pa., and Joseph C. Osterhout, Bloomington, Ind., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 15, 1978, Ser. No. 961,011

Int. Cl.[2] H02H *3/22, 9/04*

U.S. Cl. 361—127 **9 Claims**



1. A gapless surge arrester, comprising:

(a) an open-ended, electrically non-conductive but thermally conductive elongated outer casing having a inner wall defining an opening therethrough;

(b) elongated means extending through said opening for passing surge currents, said surge current passing means being spaced along its entire length from the inner wall of said casing so as to provide a circumferential gap between said means and said inner wall along the entire length of said opening; and

(c) means consisting essentially of electrically non-conductive particulate material filling the entire circumferential gap between said inner wall and surge current passing means, said particulate material having a thermal conductivity greater than that of air at temperatures of about −40° C. to +200° C.

4,223,367

CIRCUIT FOR DRIVING SAW-TOOTH CURRENT IN A COIL

Giuseppe Zappala, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

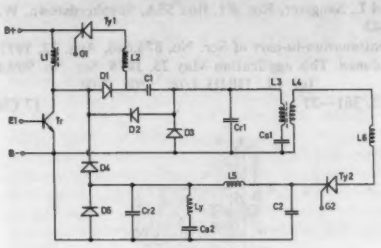
Filed Jun. 12, 1978, Ser. No. 914,391

Claims priority, application Italy, Jun. 13, 1977, 68364 A/77; Jun. 27, 1977, 68475 A/77

Int. Cl.[2] H03K *4/83*

U.S. Cl. 361—156 **10 Claims**

1. A circuit arrangement for driving saw-tooth current through a coil comprising a trace capacitor and a retrace capacitor, connected in a closed loop with said coil, a current recovery diode connected in parallel with the said retrace capacitor a first controllable switch, having a control electrode operative to receive periodic control signals to render the said first switch conductive during part of the trace interval, and an inductance connecting the said first switch to a power supply source in which energy is stored during the interval in which the said first switch is conductive and from which energy is supplied to the said retrace capacitor by way of a second diode and a third capacitor when the said first switch is not conductive, the energy stored in the said third capacitor when the said first switch is not conductive, being restored to the supply



source when the said first switch is conductive by way of a second controllable switch.

4,223,368

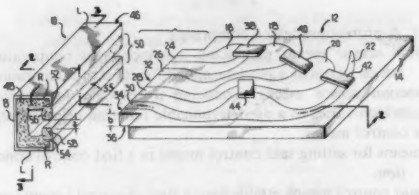
ELECTROSTATIC DISCHARGE PROTECTION DEVICE

Donald P. Dattilo, 2302 Taylorsville Rd., Louisville, Ky. 40205

Filed Sep. 14, 1978, Ser. No. 942,453

Int. Cl.[2] H05F *3/02*

U.S. Cl. 361—220 **10 Claims**



1. A device for protecting a circuit board assembly, having insertion type edge connectors, disposed along at least one side edge thereof, from damage due to electrostatic discharge through the circuits of said assembly, said device comprising in combination:

an elongate clamping member of resilient material having a longitudinal mouth co-extending therewith;

an electrically conductive foam material disposed within said mouth along at least one edge thereof and co-extending therewith to present an opening of predetermined width;

said device being clipped onto said one edge of said circuit assembly, which has a thickness that exceeds said predetermined width of said opening, in such alignment as to present the connectors disposed along said at least one side in frictional contact with said foam material whereby said device clampingly engages said circuit assembly and effects electrical connection between and among said edge connectors and said foam material to allow electrostatic discharge to proceed through said foam material.

4,223,369

MONOLITHIC CAPACITOR WITH LOW FIRING ZIRCONATE AND NICKEL ELECTRODES

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

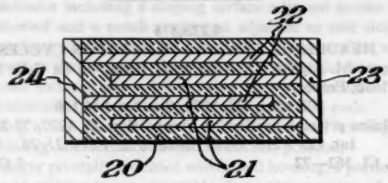
Continuation-in-part of Ser. No. 715,036, Aug. 17, 1976, Pat. No. 4,101,952. This application Jul. 3, 1978, Ser. No. 921,386

Int. Cl.[2] H01G *4/12*

U.S. Cl. 361—321 **6 Claims**

1. A monolithic ceramic capacitor comprising: a low-firing reduction-resistant zirconate body, said body having a full

densification temperature of less than 1400° C., said body consisting essentially of from 90 to 99.85 percent by weight of a high firing phase selected from barium zirconate, strontium zirconate, calcium zirconate and combinations thereof, and



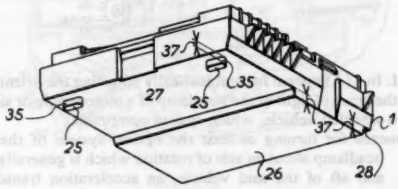
from 0.15 to 10 percent by weight of a low melting boron phase; a nickel electrode being buried within said body; and another metal electrode contacting said body and being in capacitive relationship with said buried electrode.

4,223,370

PLUGGABLE MINIATURE RELAY

Eugene M. Quere, Brunoy, and Pierre M. Le Rolland, Le Plessis Trevise, both of France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 10, 1978, Ser. No. 876,804
Claims priority, application France, Feb. 10, 1977, 77 03768
Int. Cl.[2] H02B *1/10*
U.S. Cl. 361—331 **6 Claims**



1. A pluggable miniature relay comprising:

a plug-in socket connector containing a housing having a support which receives electromechanical relay means and said support enclosed by a protecting cover, wherein said plug-in socket connector includes walls having electrical contacts mating with contacts of the relay means and, means anchoring said support to said cover, the base of said socket connector having a configuration in the same plane as the base of said relay support such that a portion of the relay support thickness is substantially identical with the thickness of said socket connector.

4,223,371

ROTATABLE AND EXPANDABLE CHASSIS AND CABINET

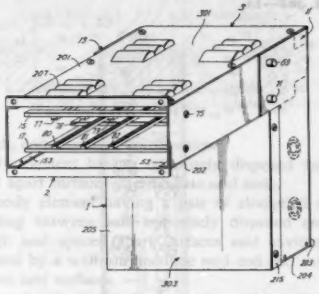
Mauro G. Togneri, P.O. Box 12818, Houston, Tex. 77017

Filed Jul. 5, 1977, Ser. No. 812,583
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—391 **12 Claims**

1. A housing for electronic circuits, comprising:

a first end plate having a substantially flat first fixed plate, a substantially flat first rotating plate and a first connecting means for securing said first rotating plate to said first fixed plate such that the plane of said first rotating plate is parallel to the plane of said first fixed plate and such that said first rotating plate, with respect to said first fixed plate, can be selectively (1) fixed, (2) rotatable within a first single plane about a first axis and (3) rotatable within said first single plane about a second axis separate from said first axis;

a second end plate having a substantially flat second fixed plate, a substantially flat second rotating plate and a second connecting means for securing said second rotating plate to said second fixed plate such that the plane of said second rotating plate is parallel to the plane of said second fixed plate and such that said second rotating plate, with



respect to said second fixed plate, can be selectively (1) fixed, (2) rotatable within a second single plane about said first axis and (3) rotatable within said second single plane about said second axis; and

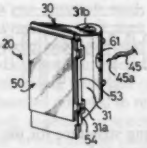
third connecting means for connecting said first end plate to said second end plate such that the planes of said first fixed and rotating plates are parallel to the planes of said second fixed and rotating plates.

4,223,372

ELECTRIC FLASH DEVICE

Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 939,704
Claims priority, application Japan, Sep. 2, 1977, 52-118271[U]; Dec. 9, 1977, 52-165292[U]
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—8 **15 Claims**



1. An electric flash device comprising a housing, a flash unit including a reflector, and mounting means for mounting said flash unit in said housing, said reflector of the flash unit comprising a frame, a reflecting mirror, and a flash tube compressively inserted into said reflecting mirror and having at least one pair of main current electrodes and a trigger electrode for triggering said main current electrodes, said trigger electrode comprising a lead wire and fastening means for fastening said lead wire to said reflector so as to electrically connect said lead wire to said reflecting mirror.

4,223,373

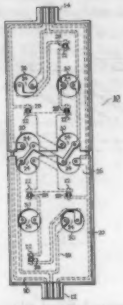
PHOTOFLASH LAMP ARRAY HAVING REFLECTIVE COATING MEANS

Edward J. Collins, Mentor-on-the-Lake; Vaughn C. Sterling, Cleveland Heights, and Harihar D. Chevali, Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 825,604, Aug. 18, 1977, Pat. No. 4,146,917. This application Jul. 13, 1978, Ser. No. 924,259

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—13 4 Claims



1. In a circuit board for a photoflash lamp array having lamp firing circuitry thereon and radiation-sensitive switches connected in said circuitry for sequentially firing associated flash lamps, the improvement wherein said circuitry is coated with an electrically insulative adhesive coating to prevent shorting of the circuitry, said electrically insulative adhesive coating further including approximately 80% or more by weight in said coating of light-reflective particulate solids which are electrically insulating dispersed therein as the sole means to reflect the light output from the associated flash lamps.

4,223,374

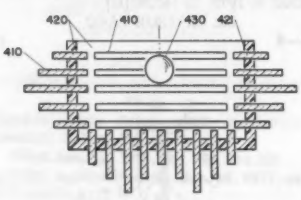
LIGHT TRANSMITTING STRUCTURE

Peter S. Kimmel, .5608 Vernon Pl., Bethesda, Md. 20034

Filed Sep. 20, 1978, Ser. No. 944,148

Int. Cl.[2] F21V *7.04*

U.S. Cl. 362—31 17 Claims



1. A light transmitting structure for use with a light source, said structure comprising at least one opaque sheet of a rigid material having a light source side and light emitting side; at least one of said opaque sheets having a plurality of separate light transmitting elements passing through it so that a first portion of each said light transmitting element is flush with or protrudes beyond said light source side of said opaque sheet, and a second portion of each said light transmitting element protrudes beyond said light emitting side of said opaque sheet; a plurality of said second portions having transparent faces, said first portions each having at least one polished edge and any number of roughened edges, said second portions each having at least one roughened edge and any number of polished edges; a plurality of said second portions passing through said opaque sheet being of varying dimensions so that a line of sight exists which passes through both a transparent face of at least one light transmitting element and a roughened edge of at least one other light transmitting element behind said transparent face.

4,223,375

HEADLIGHT SYSTEMS FOR MOTOR CYCLES

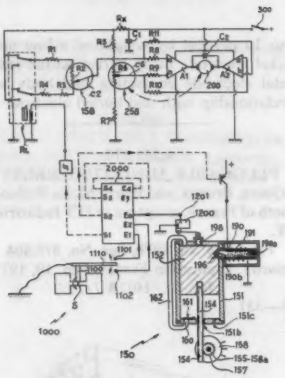
Jacques M. Alphen, 67, Allee Jules Verne, 78 La Celle Saint-Cloud, France

Filed Sep. 20, 1978, Ser. No. 944,110

Claims priority, application France, Sep. 23, 1977, 77 28724

Int. Cl.[2] F21V *33/00;* B62J *5/02;* F21V *21/26*

U.S. Cl. 362—72 5 Claims



1. In a (A) system for automatically adjusting the orientation of the beam of light of the headlamp of a motor cycle or similar two-wheeled vehicle, which system comprises:

means for turning at least the optical system of the said headlamp about an axis of rotation which is generally fore and aft of the said vehicle, an acceleration transducer comprising a mass which is adapted to be mechanically displaced by the centripetal acceleration of the said vehicle when travelling along a curved path, the amount of such mechanical displacemet being indicative of the angle of inclination of the said vehicle, and serving to control the amount by which the said optical system of the said headlamp is turned by the said turning means,

the improvement comprising a gyroscope system mounted on the said vehicle and arranged to provide signals indicating whether the said vehicle is leaning to the left or to the right, such signals serving to control the sense in which the said optical system of the said headlamp is turned by the said turning means.

4,223,376

APPARATUS FOR PROJECTING A LIGHT BEAM

Masaki Ikeda, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Division of Ser. No. 874,858, Feb. 3, 1978. This application Feb. 1, 1979, Ser. No. 8,747

Int. Cl.[2] F41G *1/34;* G05D *25/00*

U.S. Cl. 362—112 4 Claims

1. In a simulated gun apparatus for projecting a light beam, said apparatus including a housing, a trigger movably mounted on said housing, a circuit including a light bulb and a switch for controlling the operation of said light bulb located within said housing, and a shutter movable between open and closed positions for blocking and permitting the transmission of light from said light bulb the improvement which comprises:

an actuator having ends, said actuator being slidably

mounted within said housing so as to be capable of being moved between an uncocked position and a cocked position, said actuator including a cocking arm accessible from the exterior of said housing for use in moving said actuator from said uncocked position to said cocked position, said actuator including a sloping surface adjacent to one end thereof and a notch positioned adjacent to said sloping surface, said actuator also including a cam surface adjacent to the other end thereof and a notch adjacent to said cam surface, said notches being located adjacent of the extremities of said surfaces remote from said ends,

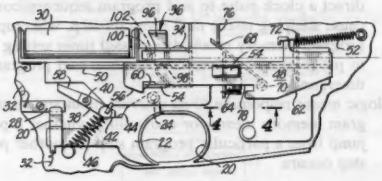
spring means connecting said actuator and said housing for biasing said actuator in said uncocked position,

a trigger pivotally mounted within said housing, a portion of said trigger being accessible from the exterior of said housing, said trigger including an actuating surface,

a latch lever pivotally mounted intermediate its ends within said housing, one of said ends of said latch lever being adjacent to said actuating surface and the other of said ends of said latch lever being adjacent to said first mentioned end of said actuator,

spring means connecting said latch lever and said housing for biasing said latch lever so that said first mentioned end of said latch lever bears against said actuating surface,

said second mentioned end of said latch lever being capable of being engaged by said sloping surface on said actuator



as said actuator is moved from said uncocked to said cocked position so as to cause rotation of said latch lever such as will permit said latch lever to engage said notch adjacent to said sloping surface so as to hold said actuator in said cocked position,

said trigger being capable of being pivoted so as to pivot said actuating lever in order to move said second mentioned end of said latch lever from engaging with said notch adjacent to said sloping surface so as to permit said spring means connecting said actuator and said housing to move said actuator to said uncocked position,

said shutter being pivotally mounted within said housing,

spring means connecting said shutter and said housing for biasing said shutter in said closed position,

lever means connected to said shutter for causing movement of said shutter between said open and closed positions,

said lever means being positioned so as to be engaged by said cam surface as said actuator is moved from said cocked position to said uncocked position so as to move said shutter to said open position, said lever means being capable of being disengaged from said cam surface when said actuator is moved into said uncocked position so as to move into said second mentioned notch, said second mentioned spring means serving to cause movement of said shutter to said closed position and said lever means into said second mentioned notch as said actuator is moved into said uncocked position.

4,223,377

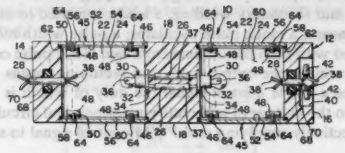
ELECTRA BRICK

Henry Williams, 99 E. 91st St., Brooklyn, N.Y. 11212

Continuation-in-part of Ser. No. 768,228, Feb. 14, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,305

Int. Cl.[2] F21S *1/02*

U.S. Cl. 362—145 **14 Claims**



1. A brick, comprising in combination:

a. a body element having oppositely disposed ends and spaced apart surfaces intermediate said ends,

b. said body element having a pair of elongated cavities extending between said oppositely disposed ends and through said spaced apart surfaces said cavities being separated by a wall intermediate said end and extending between said surfaces,

c. a channel extending between said cavities and through said wall,

d. an aperture extending between each said cavity and a respective one of each said ends,

e. electrical lighting components mounted in each of said cavities and including:

(1) a light bulb socket secured to said wall of said cavity,

(2) a light bulb secured in said socket,

(3) first electrical wires connected to each said light bulb socket through said channel, and

(4) second electrical wires connected to each said light bulb socket and exiting from said body element through each said aperture, such that adjacent bricks may be wired together in end to end relationship,

f. a light transmitting closure assembly removably secured to each of said spaced apart surfaces to fully enclose the sides of each said cavity in said body element and said electrical lighting components in each of said cavities, said assembly including:

(1) a peripheral recess on each of said spaced apart surfaces circumferentially of each of said cavities,

(2) at least one pair of brackets in each of said cavities having a threaded aperture therein,

(3) a sealing gasket in each of said recesses and substantially conforming to the shape of said cavity,

(4) a translucent lens extending in each said recess in abutting engagement with said gasket, and

(5) at least one pair of screws extending through each said lens and received through said threaded aperture in each of said brackets, such that said lens may be removed as required and wherein,

g. a chamber on an external surface of one of said ends, said chamber communicating with said cavity by means of said aperture, said chamber adapted to receive therein a pair of caps for coupling together respective second electrical wires of adjacent bricks and to constitute means facilitating the disposition of said bricks in end to end, abutting relationship.

4,223,378

SWITCHING REGULATOR

Akio Koizumi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,654

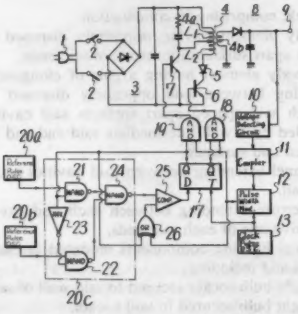
Claims priority, application Japan, Nov. 22, 1977, 52-140403

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—26 **11 Claims**

1. In a switching regulator including a DC voltage source

having first and second DC output terminals; a switching transformer having a magnetic core, first and second primary windings connected in series, a secondary winding, a first switching transistor connected in series between said first and second DC output terminals through said first primary winding; a second switching transistor connected in series between said first and second DC output terminals through said first and second primary windings; rectifying means connected across said secondary winding, a load connected to said rectifying means; a clock pulse oscillator; a pulse width modulator supplied with both the outputs from said clock pulse oscillator and as well as the output from said rectifying means so as to produce a PWM control signal the duty of which is proportional to the voltage of said rectifying means; and circuit means for selectively supplying said PWM control signal to said first



and second switching transistors in response to the circumstance of said load; said switching regulator further comprising:

(a) reference pulse signal generating means for producing a reference pulse signal having a standard pulse width;

(b) comparing means for comparing the pulse width of said PWM control signal with that of said reference pulse signal and producing a switching signal indicative of the circumstance of said load in response to the comparison result therebetween; and

(c) said circuit means including a gate circuit supplied with the PWM control signal from said pulse width modulator and the switching signal from said comparing means so as to supply the PWM control signal to one of said first and second switching transistors in response to said switching signal.

4,223,379

ELECTRONIC APPLIANCE CONTROLLER WITH FLEXIBLE PROGRAM AND STEP DURATION CAPABILITY

Robert J. Simcoe, Liverpool, N.Y., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1978, Ser. No. 913,252
Int. Cl.[2] G06F 15/46; H01H 43/00
U.S. Cl. 364—104 **23 Claims**

1. An electronic controller comprising:

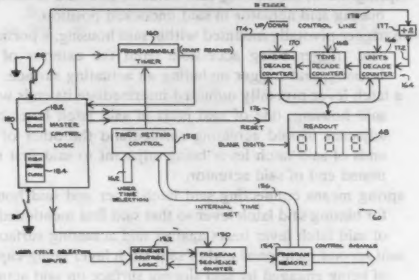
a digital program sequence counter capable of stepping from one state to the next in response to clock pulses, and capable further of selectively either stepping to the next state of a regular counting sequence, or jumping to a particular arbitrary state, each sequence counter state representing a particular program step;

a programmable digital timer for establishing any one of a plurality of different time durations, said programmable timer operable to count clock pulses and to output a signal when the number of clock pulses corresponding to a programmed time duration have been inputted;

a timer setting control operable to program said programmable timer;

program memory means responsive to the state of said program sequence counter for directing said timer setting control to program a time duration desired for any particular program step;

control logic means for directing the operation of said program sequence counter and said digital timer to effect periodic program advancing operations, said control logic means operable in the event a signal has not been received from said programmable timer to direct a clock pulse to



said programmable timer for each program advancing operation, and said control logic means operable in the event a signal is received from said programmable timer to direct a clock pulse to said program sequence counter to cause stepping to the next program step, whereupon said program memory means directs said timer setting control to program a new time duration into said programmable timer; and

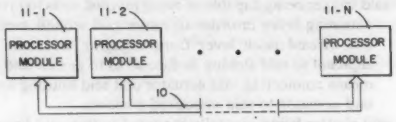
logic means responsive to an external input and to said program memory means for controlling whether a program jump from a particular program step to another program step occurs.

4,223,380

DISTRIBUTED MULTIPROCESSOR COMMUNICATION SYSTEM

Joseph C. Antonaccio, Hazlet, N.J., and Bernard J. Verreau, Milford, Del., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 6, 1978, Ser. No. 893,856
Int. Cl.[3] G06F 15/16; H04J 3/00
U.S. Cl. 364—200 **22 Claims**



1. A distributed multi-data processor system wherein a plurality of processor modules, each of which contains a data processor, are distributed along a communication link by way of which the transfer of information from one processor module to another processor module may take place, and wherein the receiving processor module will acknowledge receipt of the information characterized in that each processor module includes:

means for repetitively generating a plurality of time-slots each preassigned to one of said processor modules;

first means, responsive to a request from said data processor for the transmission of a message to another processor module, for recognizing its preassigned time-slot and transmitting a message character during its preassigned time-slot, said message character containing the address of

said another processor module and a priority code defining the priority level of the message character;

second means, coupled to said first means, for monitoring said communication link for acknowledgement of receipt of said message character by said another module, and enabling said first means to continuously transmit said message character during each successive occurrence of said preassigned time-slot until said another module acknowledges receipt of said message character and

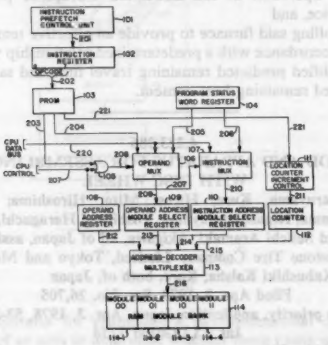
means responsive to receiving the priority code of the message character for altering the priority level of all subsequent message characters which will be accepted by said another module.

4,223,381

LOOKAHEAD MEMORY ADDRESS CONTROL SYSTEM

James O. Rozell, Richardson, and David W. Abmayr, Carrollton, both of Tex., assignors to Harris Corporation, Cleveland, Ohio

Filed Jun. 30, 1978, Ser. No. 921,075
Int. Cl.[2] G06F *13/00, 9/06*
U.S. Cl. 364—200 **19 Claims**



1. In a data processing system having a central processing unit, a memory module bank containing a plurality of memory modules, an instruction storage buffer in which instructions retrieved from said memory module bank are stored, and a memory access unit, coupled to said central processing unit and said instruction storage buffer, for controlling the addressing of locations in said memory module bank relative to which instructions and operands associated with said instructions are accessed, the improvement wherein said memory access unit comprises:

first means, coupled to said instruction storage buffer, for generating a first memory identification code representative of a selected one of said memory modules in accordance with the contents of the opcode portion of an instruction stored in said instruction storage buffer; and

second means, coupled to said first means, for generating a second memory identification code representative of the address location in the memory module from which the next instruction to be executed may be obtained in accordance with said opcode portion of the instruction stored in said instruction storage buffer.

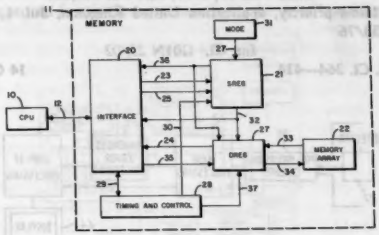
4,223,382

CLOSED LOOP ERROR CORRECT

Lee T. Thorsrud, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,993
Int. Cl.[2] G06F *11/00*
U.S. Cl. 364—200 **4 Claims**

1. In a computer having a memory module containing a memory array with a plurality of addressable locations into which data may be written and from which data may be read and containing an error correction circuit coupled to said memory array for generating error codes for data written into said memory array and correcting errors in data read from said memory array, and having a central processing unit responsively coupled to said memory module wherein said central processing unit is programmable through the execution of a series of software instructions, the apparatus for permitting said central processing unit to test said error correction circuit comprising:



means responsively coupled to said central processing unit for recording that said central processing unit is testing said error correction circuit; and

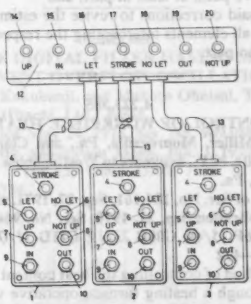
means responsively coupled to said memory array, said error circuit, and said recording means for permitting said central processing unit to write into and read from said error correction circuit without writing into or reading from said memory array.

4,223,383

ELECTRONIC CONTROL DEVICE FOR DECISIONS AND SCORING

James T. Hannah, 1 Cooinda Ct., Salisbury Heights, South Australia, Australia

Filed Oct. 10, 1978, Ser. No. 949,620
Claims priority, application Australia, Nov. 18, 1977, PD2461
Int. Cl.[2] G06F *15/44;* G08B *23/00*
U.S. Cl. 364—411 **7 Claims**



1. An electronic control device for decisions and scoring comprising at least three control boxes, each control box having designated decision members each switchable between two logic states by a person to indicate a decision or score, an indicator panel having energisable indicator means designated to correspond to the said decision members and remote from the said control boxes, and electronic digital logic circuitry between the said decision members in the said control boxes and the energisable indicator means in the said indicator panel, said digital logic circuitry being arranged to actuate the said indicator means when similarly designated decision members

situated in at least two separate control boxes are actuated to establish a predetermined logic pattern whereby the indicator means indicates the logic pattern of such actuated decision members.

4,223,384

RADIOGRAPHY

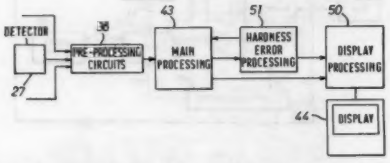
Godfrey N. Hounsfield, Newark, and MacArthur J. Gollifer, Stoke Poges, both of England, assignors to EMI Limited, Hayes, England

Filed Jun. 29, 1977, Ser. No. 811,281

Claims priority, application United Kingdom, Jul. 1, 1976, 27533/76

Int. Cl.[2] **G01N** *23/02*

U.S. Cl. 364—414 **14 Claims**



1. A method of correcting for errors introduced into a representation, of the distribution of absorption of radiation in a region of a patient's body, derived from measurements of the radiation transmitted through the region along a plurality of paths passing therethrough at a plurality of angles, where the errors result from changes in the energy spectrum of the radiation, the method including the steps of:

(a) using the radiation measurements to determine a first estimate of the representation in the form of estimates of the absorption of the radiation in individual elements of a matrix of elements notionally defined in the region,

(b) determining from the first estimate the positions in the region of specific elements having absorption which differs from a reference level by more than a predetermined amount,

(c) deriving for each of the radiation paths, corrections for said changes in the energy spectrum of the radiation caused by those specific elements which intercept the respective path, at least in part, and

(d) using said corrections to revise the estimates of absorption for all elements intercepting the respective direction, at least in part.

4,223,385

CONTROL OF WORKPIECE HEATING

William R. Miller, Monroeville, Pa., and Clarence E. Peck, Williamsville, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 184,161, Sep. 27, 1971, abandoned. This application Sep. 21, 1978, Ser. No. 944,496

Int. Cl.[3] **G06F** *15/46;* **G05B** *23/19;* **C21D** *11/00;* **F27B** *9/40*

U.S. Cl. 364—472 **43 Claims**

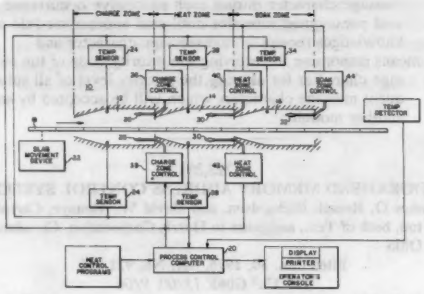
1. The method of controlling the heat content of workpieces traveling through a heating furnace operative with an associated workpiece processing device, with said furnace having at least one heating zone in which at least one workpiece is positioned within a predetermined control area located in said heating zone, said method being operative after predicting the remaining travel time of said one workpiece through said one heating zone, the steps of said method comprising,

generating a signal indicative of the effective temperature of said one heating zone,

determining the actual heat content supplied to said workpiece by said heating zone in relation to said generated signal indicative of said effective temperature,

establishing the remaining heat content to be supplied to said one workpiece by said one heating zone in accordance with a predetermined relationship with said determined actual heat content,

modifying the predicted remaining travel time of said one workpiece through the heating zone in accordance with



the operation of the associated workpiece processing device, and

controlling said furnace to provide an effective temperature in accordance with a predetermined relationship with said modified predicted remaining travel time and said established remaining heat content.

4,223,386

METHOD AND APPARATUS FOR ASSEMBLING TIRE WITH DISC WHEEL

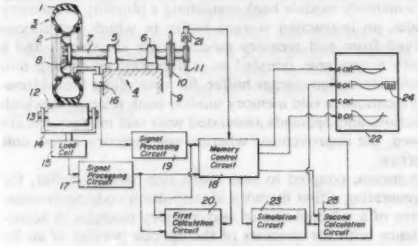
Yuji Maruyama, Kure; Hirosi Mita, Hiroshima; Hiroshi Fukuyama, Higashimurayama; Yoshifumi Haraguchi, Kunitachi, and Seiichi Aramaki, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo and Maruyama Seiki Kabushiki Kaisha, Kure, both of, Japan

Filed Apr. 3, 1979, Ser. No. 26,705

Claims priority, application Japan, Apr. 3, 1978, 53-39614

Int. Cl.[3] **G01M** *1/36*

U.S. Cl. 364—506 **2 Claims**



2. An apparatus for assembling a tire with a disc wheel comprising means for rotating a wheel assembly body composed of a tire and a disc wheel assembled with each other for several rotations under a loaded condition; means for electrically measuring and memorizing radial force variation of the wheel assembly body and inner diameter variation of a disc wheel proper during the rotation of the wheel assembly body; means for deriving radial force variation of a tire proper by subtracting the inner diameter variation of the disc wheel proper from the radial force variation of the wheel assembly body and memorizing the radial force variation of the tire proper; means for effecting electrical simulation so as to relatively phase shift the inner diameter variation of the disc wheel proper and the radial force variation of the tire proper; means for determining the optimum assembled condition of the wheel assembly body by effecting a phase shift between the inner

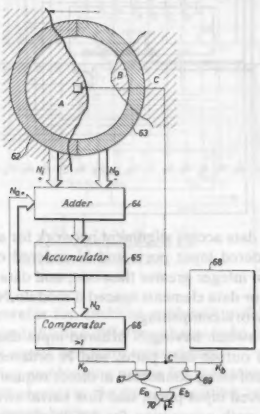
diameter variation of the disc wheel proper and the radial force variation of the tire proper and determining the amount of the relative phase shift; and means for correcting the assembled condition of the wheel assembly body on the basis of the amount of phase shift thus determined.

4,223,387

DEVICE FOR EXAMINATION OF DISTANCES IN A PICTURE

Per-Erik Danielsson, Hedborns Gata 30, S-582 49 Linköping, Sweden, and Carl A. B. Kruse, Kindlyckevägen 9, S-590 41 Rimforsa, Sweden

Filed Dec. 22, 1978, Ser. No. 972,640
Claims priority, application Sweden, Jan. 20, 1978, 7800736
Int. Cl.[2] G06F *15/46;* G06K *9/12*
U.S. Cl. 364—515 **12 Claims**



1. Apparatus for examining a two-dimensional quantized picture of an area to determine whether there exists within the area any objects which are closer than a pre-determined acceptable minimum distance from each other, said picture comprising discrete picture elements each of which represents a unit of said area, each picture element being assigned either a value of logical 1 when an object occupies any part of a corresponding unit of area, or a value of logical 0 when no object occupies any part of said corresponding unit of area, comprising:

(a) an array of interconnected logical cells for scanning said picture in a sequence of uniform sub-pictures, each of said sub-pictures having dimensions related to the minimum distance allowable between objects in the quantized picture;

(b) means associated with said array for determining the number of objects within a sub-picture at any time;

(c) means for generating a warning signal when the number of objects inside a sub-picture is greater than one.

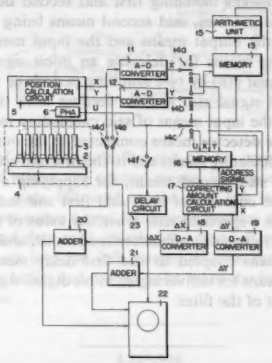
4,223,388

SCINTILLATION CAMERA

Mineki Nishikawa, Nakamachi; Makoto Kakegawa, Kawasaki; Masayuki Iwanaga, and Koujirou Shouta, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 4, 1978, Ser. No. 893,516
Claims priority, application Japan, Apr. 4, 1977, 52-38214
Int. Cl.[2] G01T *1/20*
U.S. Cl. 364—521 **8 Claims**

1. A scintillation camera having a radiation detecting means for detecting radiation, a radiation position calculation means for calculating the radiation position from the output signal of the radiation detecting means and a display means for displaying the radiation position in response to the output position signal from the radiation position calculation means, comprising: reference radiation means including a radiation shielding member having a plurality of through-holes; a first memory for storing a picture of said reference radiation means during a calibrating mode in dependence on said position signal of said radiation position calculation means when detecting radiation radiated from said reference radiation means; an arithmetic unit for computing a reference correcting amount at each cross point in a given matrix in dependence on a departure of the position of each hole of said radiation shielding member in said picture stored in said first memory from the actual position of



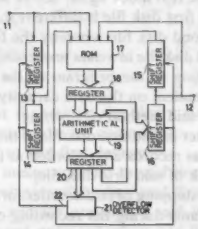
the corresponding hole of said radiation shielding member; a second memory for storing said reference correcting amounts; a correcting amount calculation circuit which, during a measuring mode of the position of a radiation to be measured and in response to said position signal from said radiation position calculation means, reads from said second memory selective reference correcting amounts and utilizes said selective reference correcting amounts to calculate a correcting amount for the position of said radiation to be measured; and an adding circuit for adding said correcting amount to said position signal from said radiation position calculation means when detecting said radiation to be measured.

4,223,389

RECURSIVE DIGITAL FILTER HAVING MEANS TO PREVENT OVERFLOW OSCILLATION

Eiichi Amada, Kokubunji, and Makoto Ohnishi, Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed May 24, 1978, Ser. No. 909,066
Claims priority, application Japan, Jun. 3, 1977, 52-64819
Int. Cl.[2] G06F *15/34, 7/38*
U.S. Cl. 364—724 **9 Claims**



1. A recursive digital filter comprising:

(a) first means to which an m-bit digital input signal x(n) is applied,

(b) calculating means having an input and an output means, said input means connected to said first means, for delivering from said output means thereof a digital signal y(n) shown by a formula,

$$y(n) = \sum_{k=0}^{M} a_k \cdot x(n-k) + \sum_{k=1}^{N} b_k \cdot y(n-k)$$

where n represents a natural number, N and M are orders representing a delay of signal transmission, and a_k and b_k are coefficients with $a_M, b_N \neq 0$, and $N \geq 2$,

(c) second means including first and second delay means connected in series, said second means being connected between the output means and the input means of said calculating means for delaying an m-bit signal of said digital signal y(n) by two sampling periods or more from said input signal x(n) and for feeding back the delayed signal to the input means of said calculating means,

(d) overflow detector means connected to the output means of said calculating means and to the first and second delay means of said second means, for supplying a signal for setting the contents of both said first and second delay means into a specified state when the value of said digital signal y(n) exceeds a predetermined value, and

(e) third means coupled to said first delay means of said second means for delivering an m-bit digital signal y(n) as the output of the filter.

4,223,390

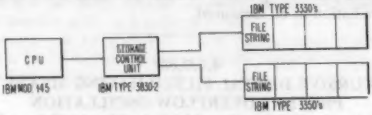
SYSTEM AND METHOD FOR ATTACHING MAGNETIC STORAGE DEVICES HAVING DISSIMILAR TRACK CAPACITIES AND RECORDING FORMATS

Earl Q. Bowers, and David L. Nelson, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 589,288, Jun. 23, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 653,684

Int. Cl.[2] **G06F** *13/00*

U.S. Cl. 364—900 **22 Claims**



1. A method for generating a virtual index signal for a first disk file in which the byte capacity per track is greater than the specified byte capacity per track of a second disk file which would generate the real index signal and in which the recording format of said first disk file is different than the recording format of said second disk file whereby the first disk file may replace the second disk file in a data processing system without changing the portion of the program of the data processing system that is dependent on the byte capacity per track of the attached disk file, said method comprising:

stepping a counter in said first disk file at the data rate of said first disk file as records are recorded as bytes of information on a track of said first disk file;

interrupting the stepping of said counter for a predetermined number of counts during the recording of each record;

monitoring the contents of said counter; and

generating said virtual index signal when said monitoring step indicates that the contents of said counter corresponds to the said specified byte capacity per track of said second disk file.

4,223,391

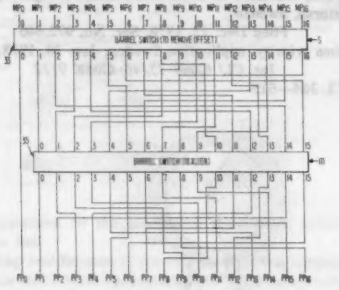
PARALLEL ACCESS ALIGNMENT NETWORK WITH BARREL SWITCH IMPLEMENTATION FOR D-ORDERED VECTOR ELEMENTS

George H. Barnes, Wayne, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 820,234, Jul. 29, 1977, Pat. No. 4,162,534. This application Oct. 31, 1977, Ser. No. 847,212

Int. Cl.[3] **G06F** *7/00*

U.S. Cl. 364—900 **3 Claims**



1. A parallel data access alignment network for aligning data between N ordered input ports and N ordered output ports wherein N is an integer greater than one, said data comprising d-ordered vector data elements spaced d modulo N input ports apart, said network comprising:

a first barrel switch having N ordered input data paths and N ordered output data paths, said N ordered input data paths thereof being connected in direct sequential order to the N ordered input ports, said first barrel switch providing a data path connection for a data element in said d-ordered vector data elements to the lowest ordered output data path of said first barrel switch in said N ordered output data paths thereof;

a second barrel switch having N−1 ordered input data paths and N−1 ordered output data paths and being responsive to a shift control signal for shifting data flow therebetween, said N−1 ordered input data paths thereof being connected to the N−1 highest ordered data output paths of said N ordered output data paths of said first barrel switch according to the relationship $x=k^y$ modulo N wherein x represents the output data path ordering of said first barrel switch, y represents the input data path ordering of said second barrel switch and k represents a primitive root of N, and said N−1 ordered output data paths of said second barrel switch being connected to the N−1 highest ordered output ports of said N ordered output ports in the same ordering sequence by which said N−1 ordered input data paths of said second barrel switch are connected to said N−1 highest ordered output data paths of said first barrel switch;

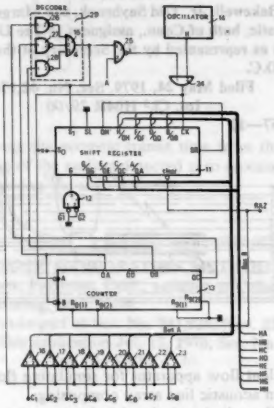
data path means for connecting the lowest ordered data path output of said N ordered data path outputs of said first barrel switch to the lowest ordered output port of said N ordered output ports; and

shift control means for generating said shift control signal and providing same to said second barrel switch, said shift control signal generated from the relationship $d=k^m$ modulo N wherein d is said d-ordered vector data element input port spacing, k is said primitive root of N, N is said integer greater than one, and m is said shift control signal specifying the amount of shift in said second barrel switch between said N−1 ordered data output paths thereof and said N−1 ordered data input paths thereof.

4,223,392
CLOCK-SIGNAL GENERATOR FOR A DATA-PROCESSING SYSTEM

Francis Lemaire; Pierre Salkazanov, both of Plaisir, and Robert Bavoux, Rueil-Malmaison, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Jan. 31, 1978, Ser. No. 873,845
Claims priority, application France, Feb. 7, 1977, 77 03316
Int. Cl.[2] G06M *3/02*; H03K *3/00*; G06F *1/04*
U.S. Cl. 364—900 **8 Claims**



1. An apparatus for enabling a plurality of like-frequency sub-clock signals having differing phases to be generated from a main clock signal generator comprising:

a first setting and logging means for indicating a state of the sub-clock signals in the form of multibit information;

a second means having:

a multiple taps memory means for storing the state of the sub-clock signals as logged by the said first means,

means for shifting the state of the sub-clock signals stored in said memory means, and

output means responsive to signals at the multiple taps of the memory means for deriving the sub-clock signals;

a third means for controlling the shifting of the sub-clock signal state contained in the said second means by one bit for each cycle of the main clock signal; and

a fourth means controlled by the main clock signal generator for counting the number of shifts of the sub-clock states in said second means, and means responsive to a predetermined count of the number of shifts for controlling the loading into the second means the state of the sub-clock signals indicated by the first means.

4,223,393
WORD PROCESSOR

Shintaro Abe, and Tomoyuki Haganuma, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,274
Claims priority, application Japan, Aug. 11, 1977, 52-96410
Int. Cl.[2] G06F *1/00*; B41J *19/00, 21/02*
U.S. Cl. 364—900 **10 Claims**

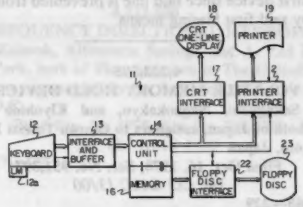
1. A word processor including an input keyboard, a memory for storing data input from the keyboard, a display unit for displaying one line of data from the memory, a printer for printing the line of data, a display buffer for storing the line of data display by the display unit, a print buffer for storing the line of data for printing by the printer, and control means for decoding data transmitted from the memory to the display buffer and causing the line of data to be transmitted from the memory to the print buffer for printing in response to a predetermined data code, characterized by comprising:

a left margin key constituting part of the keyboard for producing a left margin code;

numerical keys indicating a new left margin address code;

a key indicating the predetermined data code; and

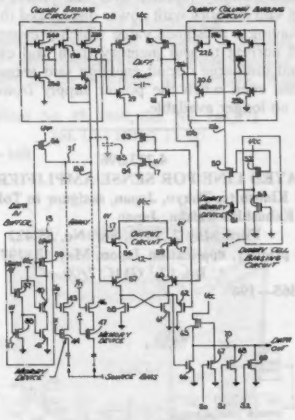
a left margin address register for storing a left margin address of the display buffer and printer connected to said control means, the control means, in response to the left margin code followed by the new left margin address code indicating a new left margin address and the predetermined data code, causing the new left margin address to be set into the left margin address register and the display buffer and printer to be set to the new left margin address.



4,223,394
SENSING AMPLIFIER FOR FLOATING GATE MEMORY DEVICES

Saroj Pathak, Campbell, and George Perlegos, Cupertino, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 13, 1979, Ser. No. 11,915
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—210 **15 Claims**



1. An amplifier for sensing the binary state of a first MOS floating gate memory device comprising:

a line coupled to said first device;

a first biasing means coupled to said line for charging said line to a first potential when said first device is in one binary state and for preventing said line from dropping below a second potential when said first device is in its other binary state;

a second floating gate memory device substantially identical to said first device for providing a reference load;

a biasing circuit coupled to said second device for biasing said second device at a predetermined level;

a second biasing means coupled to said second device for providing a reference potential;

comparator means for comparing potentials, said comparator means coupled to said line and coupled to receive said reference potential;

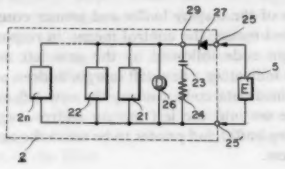
whereby said amplifier senses said binary state of said first device and is quickly able to again sense the binary state of said first device since said line is prevented from discharging by said first biasing means.

4,223,395

VOLATILE MEMORY HOLD DEVICE

Shunichi Sakaguchi, Nagaokakyo, and Kiyohide Okamoto, Ohtsu, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 16, 1978, Ser. No. 951,397
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—229 **9 Claims**



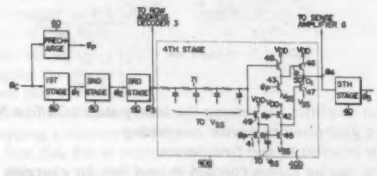
1. A volatile memory hold device comprising power terminals to which a power source is connectable, a volatile memory connected to said power terminals, the latter serving as input power terminals for said volatile memory, and a charge-and-discharge circuit connected across said power terminals in parallel with said memory, said charge-and-discharge circuit including a capacitor and a first resistor connected in series with said capacitor, said capacitor being charged by power for said volatile memory supplied over said power terminals and supplying said memory with power discharged therefrom, said resistor having a resistance value which prevents application of a rush current to said memory from said capacitor, said charge-and discharge circuit enabling said memory to retain stored data even when the power supply from said power source is no longer available.

4,223,396

DELAYED LINE FOR SENSE AMPLIFIER PULSE

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 2, 1979, Ser. No. 35,422
Claims priority, application Japan, May 18, 1978, 53-59085
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—194 **6 Claims**



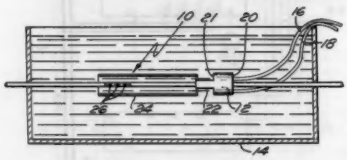
1. An integrated logic circuit comprising a logic circuit, an output selection circuit coupled to said logic circuit for selecting a desired output from said logic circuit, a detector for detecting said selected output of said logic circuit, and a pulse supply means for supplying first and second drive pulses at least to said output selection circuit and said detector respectively; said pulse supply means including a delay line receiving said first drive pulse as an input and a pulse generator composed of MOS transistors which receives as an input a delayed pulse from said delay line and delivers said second drive pulse, said delay line exhibiting a signal delay characteristic substantially equivalent to that of a signal transmission line provided between said selection circuit and said detector.

4,223,397

TURBULENT FLOW DEVICE FOR TESTING HYDROPHONES

Henry P. Bakewell, Jr., Old Saybrook, and Marguerite A. Johnson, Mystic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1979, Ser. No. 42,174
Int. Cl.[3] H04R *29/00*
U.S. Cl. 367—13 **6 Claims**



1. Turbulent flow apparatus for simulating flow conditions at sea for an acoustic line array comprising:

a generally cylindrical chamber having inlet means for allowing water to flow therein at one end thereof and outlet means for letting water to flow out of said chamber at the opposite end thereof, said chamber adapted to be surrounded around the portion of the acoustic line under test;

means for distributing water evenly inside said chamber;

means for obtaining a uniform flow of water through said chamber;

retaining means for positioning the portion of the acoustic line array under test relative to said turbulent flow apparatus; and

means for preventing a reduction in flow velocity of water flowing out of said chamber in a longitudinal region proximate said chamber for testing the portion of the acoustic line array under test.

4,223,398

METHOD FOR ACOUSTIC SIGNAL DETECTION

Sammy E. Blalock, Duncan, Okla.

Continuation-in-part of Ser. No. 831,295, Sep. 7, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 937,251
Int. Cl.[3] G01V *1/40*
U.S. Cl. 367—34 **16 Claims**

1. A method of determining acoustic transit times in an earth formation traversed by a borehole, comprising:

(a) disposing in a borehole a transmitter and first and second receivers spaced at different distances from the transmitter;

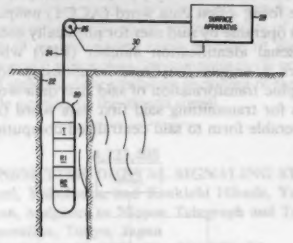
(b) transmitting a pulse of acoustic waves from the transmitter;

(c) receiving, at each receiver, a signal wave corresponding to the pulse of acoustic waves transmitted by the transmitter;

(d) detecting, at the first receiver, the times of occurrence of an early positive and an early negative zero crossing in the received signal wave, said early positive and early negative zero crossings being selected responsive to the amplitude of the received signal wave;

(e) detecting, at the second receiver, the times of occurrence of an early positive and an early negative zero crossing in

the received signal wave, said early positive and early negative zero crossings being selected responsive to the amplitude of the received signal wave; and



(f) determining the acoustic transit time from the times of occurrence of the earliest detected zero crossings at each receiver having the same polarity.

4,223,399

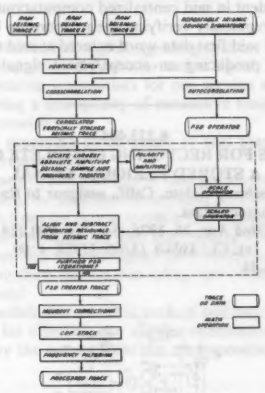
SEISMIC EXPLORATION METHOD

Gary K. Hackett, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 743,929, Nov. 22, 1976, abandoned. This application Jul. 12, 1978, Ser. No. 923,896

Int. Cl.[2] G01V *1/36*

U.S. Cl. 367—41 **20 Claims**



1. A method for seismic exploration of the earth comprising the steps of:

(1) generating a frequency variable coded energy signal characterized by an autocorrelation function having a central, single-largest absolute maximum which is at least about 1.2 times the absolute amplitude of the next largest absolute maximum of the autocorrelation function, and transmitting said coded energy signal into the earth;

(2) sensing the energy emitted from within the earth;

(3) recording a raw seismic trace which is proportional to the energy sensed in step (2);

(4) recording a source signature which is proportional to said coded energy signal;

(5) crosscorrelating said seismic trace with said source signature, thereby forming a crosscorrelated trace comprised of a plurality of seismic samples defining a plurality of seismic events and correlation residuals;

(6) autocorrelating said source signature, thereby forming a primary predictive operator comprising a central, single-largest absolute maximum and a plurality of predictive residuals; and

(7) subtractively applying said primary predictive operator to said crosscorrelated trace, whereby said correlation residuals are predictively subtracted from said crosscorrelated trace to produce a high quality processed trace on which said seismic events are identifiable.

4,223,400

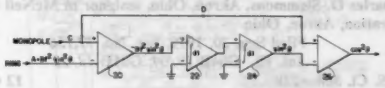
LOW-FREQUENCY DIRECTIONAL HYDROPHONE

Joseph F. Zalesak, Altomonte Springs, and A. Zed Robinson, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 28, 1978, Ser. No. 946,679

Int. Cl.[3] G01S *3/80*

U.S. Cl. 367—135 **7 Claims**



1. A hydrophone device providing a ($\cos^2 \theta$) directivity pattern comprising:

a ring transducer and a monopole transducer located in close proximity to each other with their axes being parallel;

function-conversion means, to which the outputs of said transducers are fed, for converting its input signals to an output signal proportional to ($\sin^2 \theta$);

weighted subtraction means, to which is fed the output signals of said monopole transducer and said function-conversion means, for weighting at least one of the input signals and then subtracting them to provide a ($\cos^2 \theta$) output signal.

4,223,401

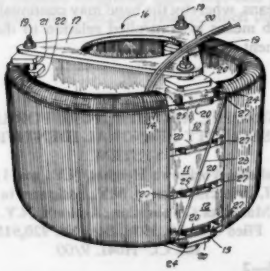
BROADBAND FREE-FLOODING MAGNETOSTRICTIVE SCROLL TRANSDUCER

Edwin J. Parssinen, Mystic, and Theodore J. Meyers, Waterford, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 15, 1968, Ser. No. 744,971

Int. Cl.[3] H04R *15/00*

U.S. Cl. 367—168 **1 Claim**



1. A broad bandwidth free-flooding magnetostrictive scroll transducer comprising:

a framework including a plurality of parallel rods rigidly joined at opposite ends and carrying radially outwardly directed supporting lugs, and means for locating the lugs along the rods,

a plurality of essentially identical ring-shaped magnetostric-

tive scrolls, each consolidated with stiff resin and essentially void-free and supported coaxially by the lugs of the framework and around the exterior of the framework, separate from one another a distance which is a minor fraction of scroll length,

compressible elastic vibration isolators between the lugs and the respective scrolls permitting the scrolls to vibrate radially relative to the framework,

a pair of nonmagnetic rings having smaller inside diameter and larger outside diameter than the scrolls clamped by lugs of the framework coaxial with the scrolls and at opposite ends of the plurality of scrolls and spaced slightly from the scrolls, and

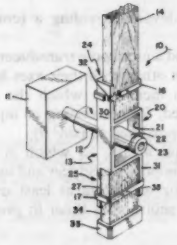
an insulated conductor toroidally coiled tightly around the coaxial pair of nonmagnetic rings.

4,223,402

CLOCK HAND LINKAGE AND SUPPORT ASSEMBLY

Charles O. Slemmons, Akron, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Sep. 20, 1979, Ser. No. 77,756
Int. Cl.[3] G04B *19/04*; G01D *13/22*
U.S. Cl. 368—238 **12 Claims**



1. A clock hand linkage and support assembly for use with a clock drive mechanism having limited driving torque and power supply and which rotationally increments a hand in discrete intervals through a drive shaft, comprising:

hub means having a central portion through which the drive shaft may pass for free rotation about the drive shaft and at least one angle bracket stay means for support of the hand;

compliant fastening means biasing the hand into flexible engagement with said angle bracket stay means; and

resilient linkage means coupled to the drive shaft and said hub means, whereby the hand may continually rotate with the hub means in controlled relation to the incremental movement of the drive shaft.

4,223,403

CRYPTOGRAPHIC ARCHITECTURE FOR USE WITH A HIGH SECURITY PERSONAL IDENTIFICATION SYSTEM

Alan G. Konheim, Yorktown Heights, N.Y., and Louis B. Tuckerman, III, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,915
Int. Cl.[3] H04L *9/00*
U.S. Cl. 375—2 **16 Claims**

1. A personal identification system for effecting the authentication of users at a series of remote terminal devices, each of which is connected to a central computational facility, wherein each terminal includes means for entering personal identification criteria and further includes a resident encryption/decryption device located therein, the improvement in said personal identification system which comprises:

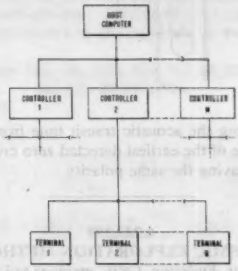
secure means external to each said terminal for verifying said user entered personal identification criteria,

said system comprising at least one central computational facility to which each of said terminals is connected,

each said terminal including means therein for reading a user inserted token having printed thereon, in machine readable form, a first data word (ACCT) unique to said user,

means operable by said user for physically entering a unique personal identification number (PIN) where said PIN bears a unique functional relationship to the cryptographic transformation of said first data word,

means for transmitting said first data word (ACCT) in recoverable form to said centralized computing facility,



means for cryptographically transforming said first data word as a function of at least said PIN under a suitable encryption key and for transmitting same to said centralized computational facility, wherein said encryption key is a function of said PIN,

means resident in said centralized computational facility for cryptographically verifying the relationship between said PIN and said first data word entered at said terminal and,

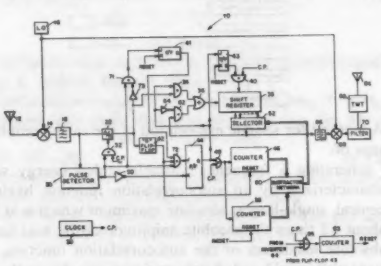
means for producing an accept/reject signal in response thereto.

4,223,404

APPARATUS FOR RECYCLING COMPLETE CYCLES OF A STORED PERIODIC SIGNAL

Oscar Lowenschuss, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 26, 1978, Ser. No. 900,224
Int. Cl.[2] H04B *15/00*; H03K *4/00*
U.S. Cl. 375—94 **4 Claims**



4. Apparatus for storing a periodic input signal and for recycling complete cycles of such periodic input signal, comprising:

(a) means for producing control signals at times related to the times the periodic input signal with an amplitude cyclically passing through a predetermined level passes through such level with a predetermined slope, each control signal indicating the start of a cycle of the periodic input signal;

(b) storage means;

(c) means for commencing storage of said periodic input

signal in the storage means in response to a first one of such control signals;

(d) means responsive to the control signals for producing a signal representative of a time interval Δ of an incomplete cycle portion of the stored periodic input signal; and

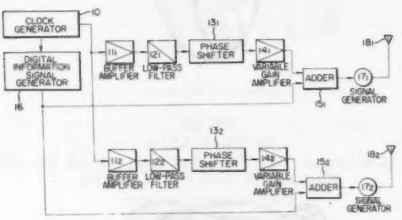
(e) means, responsive to the signal representative of the time interval Δ of an incomplete cycle portion of the stored periodic signal for recycling the complete cycle portion of the stored signal and for inhibiting recycling of the incomplete cycle portion of the stored signal.

4,223,405

MULTITRANSMITTER DIGITAL SIGNALING SYSTEM

Takeshi Hattori, Yokohama, and Kenkichi Hirade, Yokusuka, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,636
Claims priority, application Japan, Jun. 20, 1977, 52/72139
Int. Cl.[2] H04B *1/04, 7/26*
U.S. Cl. 455—105 **3 Claims**



1. A multitransmitter digital signaling system, comprising:

means for supplying digital information signals to a plurality of base station transmitters for one service area, said signals having a multiplicity of successive time slots associated therewith;

means for supplying clock pulses to said plurality of base station transmitters;

means at each of said plurality of base station transmitters for converting, the supplied clock pulses into an output wave different from the waves in other base station transmitters;

adder means at each of said base station transmitters for superimposing on said digital information signals the output wave from the corresponding one of said converting means; and

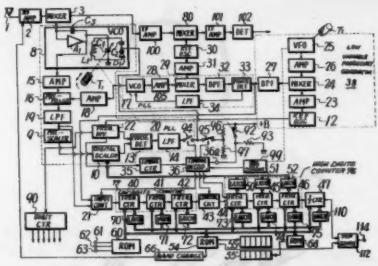
angular modulation means at each of said base station transmitters for effecting the angular modulation of a carrier signal by the output from the corresponding one of said adder means at a modulation index having the same value for all of said angular modulation means.

4,223,406

MULTI BAND RADIO RECEIVER SYSTEM WITH PHASE LOCKED LOOP

Noboru Someno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,571
Claims priority, application Japan, Jan. 30, 1978, 53-9137
Int. Cl.[3] H04B *1/26*
U.S. Cl. 455—180 **19 Claims**



1. Apparatus for producing a variable local oscillator frequency signal for use in a radio receiver comprising: controllable means for generating a variable frequency signal; phase locked loop means for generating said variable local oscillator frequency signal including mixer means for mixing signals related to said variable frequency signal and said variable local oscillator signal to produce a third frequency signal, scaler means for dividing said third frequency signal by a changeable scale factor to produce a fourth frequency signal, and error signal generating means for generating an error signal in response to said fourth frequency signal varying from a reference frequency said error signal controlling said phase locked loop generated variable local oscillator signal; and scale factor determining means, for producing said changeable scale factor in relation to at least one of the frequencies of said variable frequency signal and said third frequency signal, including a plurality of frequency counters in cascade and input control means operative for gating a signal related to said third frequency signals into said plurality of frequency counters for a predetermined time, and further operative for gating a signal related to said variable frequency signal into said plurality of frequency counters for a second predetermined time.

256,848

LONG ROLL SANDWICH

John P. Garneau, 2366 NE. 28th St., Lighthouse Point, Fla. 33064

Filed Jan. 23, 1978, Ser. No. 871,426
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—24

256,849

BODY BRIEFER

Magnhild L. Bergh, Hamden, Conn., assignor to The Strouse, Adler Company, New Haven, Conn.

Division of Ser. No. 772,899, Feb. 24, 1977, Pat. No. Des. 252,656. This application Feb. 26, 1979, Ser. No. 14,973
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—3

256,850

SAFETY RESTRAINT VEST OR THE LIKE

Richard K. Donahue, 37 Ballard La., Millis, Mass. 02054

Filed Jun. 29, 1978, Ser. No. 920,367
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

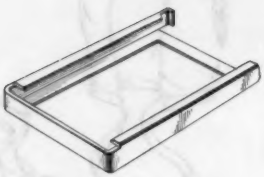
256,851

HELMET

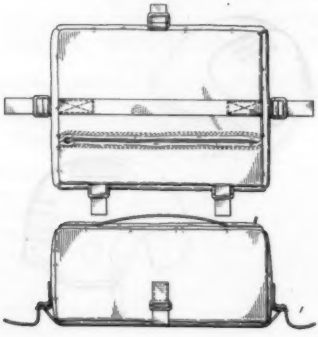
Welton U. Knadle, Santa Monica, and Robson L. Splane, Jr., Northridge, both of Calif., assignors to Wilmark Designs, Inc., Santa Monica, Calif.

Filed Jul. 3, 1978, Ser. No. 921,877
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—232

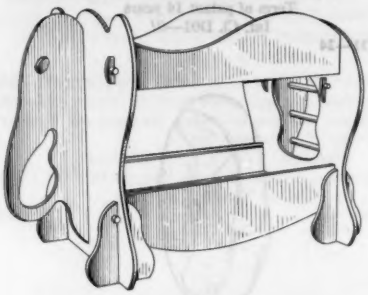
256,852
CREDIT CARD HOLDER
Francis M. McGahee, P.O. Box 487, Orange Park, Fla. 32073
Filed Jul. 22, 1977, Ser. No. 818,238
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—56



256,853
INSULATED CONTAINER
Peter W. McGennis, 41 Saybrook Pl., Buffalo, N.Y. 14209
Filed Feb. 21, 1978, Ser. No. 879,695
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

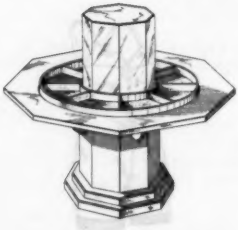


256,854
ELEPHANT BUNK BED
Angus J. Bruce, 398 W. Broadway, New York, N.Y. 10012
Filed Jun. 12, 1978, Ser. No. 914,914
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—5



256,855
DISPLAY RACK
Jack H. Carpenter, 1525 Winchester Ave., Ashland, Ky. 41101
Filed Jun. 28, 1979, Ser. No. 47,778
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

256,856
TABLE FOR USE IN THE SELECTION AND FITTING OF EYEGLASSES
Edward B. Kleinman, 1675 E. Churchill Downs, Germantown, Tenn. 38138
Filed Apr. 24, 1979, Ser. No. 32,858
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—25



256,857

FOLDABLE CHAIR

Roger Tallon, Paris, France, assignor to Design Programmes S.A., Paris, France

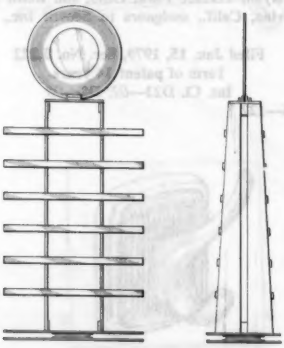
Filed Jul. 27, 1978, Ser. No. 928,406
Claims priority, application France, Feb. 3, 1978, 78 76321
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

256,858

JEWELRY DISPLAY STAND

Sarkis Bedrosian, Cranston, R.I., assignor to Ansa, Ltd., Providence, R.I.

Filed Sep. 18, 1978, Ser. No. 944,658
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

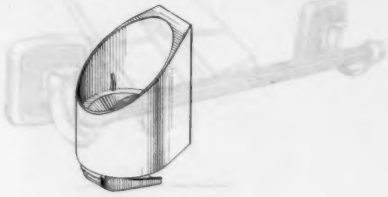


256,859

COMBINED PARTICULATE DISPENSING BASE AND MOUNTING BRACKET

Stephen G. Hauser, 4133 Aleman Dr., Tarzana, Calif. 91356, and Keith S. Keith, 1722 N. Courtney Ave., Los Angeles, Calif. 90046

Filed Sep. 14, 1977, Ser. No. 833,379
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

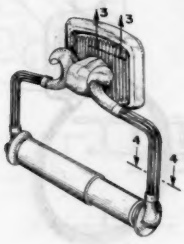


256,860

SUPPORT FOR BATHROOM TISSUE

Thomas J. Ryan, Terrace Park, Ohio, and Keith E. Ridgway, West Covina, Calif., assignors to Scovill Inc., Waterbury, Conn.

Filed Jan. 15, 1979, Ser. No. 3,204
Term of patent 14 years
Int. Cl. D23—*02*; D8—*06*
U.S. Cl. D6—97



256,861

BATHROOM SUPPORT FIXTURE

Thomas J. Ryan, Terrace Park, Ohio, and Keith E. Ridgway, West Covina, Calif., assignors to Scovill Inc., Waterbury, Conn.

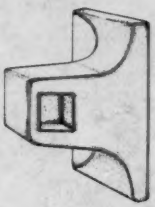
Filed Jan. 15, 1979, Ser. No. 3,429
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

256,862
TOWEL BAR
Thomas J. Ryan, Terrace Park, Ohio, and Keith E. Ridgway, West Covina, Calif., assignors to Scovill Inc., Waterbury, Conn.
Filed Jan. 15, 1979, Ser. No. 3,360
Term of patent 14 years
Int. Cl. D23—*02;* D8—*09, 06*
U.S. Cl. D6—99

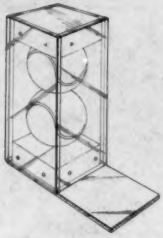
256,863
TOWEL RING
Thomas J. Ryan, Terrace Park, Ohio, and Keith E. Ridgway, West Covina, Calif., assignors to Scovill Inc., Waterbury, Conn.
Filed Jan. 15, 1979, Ser. No. 3,430
Term of patent 14 years
Int. Cl. D23—*02;* D8—*06*
U.S. Cl. D6—99

256,864
TOWEL BAR
Carlson L. Nippel, Irvine, and Richard K. Mitts, Fullerton, both of Calif., assignors to Scovill Inc., Waterbury, Conn.
Filed Oct. 29, 1979, Ser. No. 89,568
Term of patent 14 years
Int. Cl. D23—*02;* D8—*06, 09*
U.S. Cl. D6—99

256,865
TOWEL RACK BRACKET
Douglas M. Crowe, Richmond Hill, Canada, assignor to Smith & Stone Limited, Toronto, Canada
Filed Aug. 7, 1979, Ser. No. 64,647
Claims priority, application Canada, Feb. 20, 1979, 20-02-79
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—103

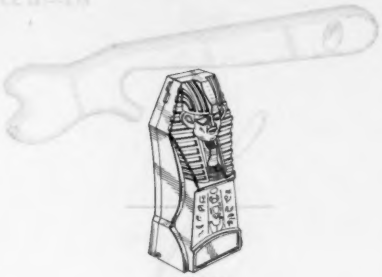


256,866
BOOKEND
Ted R. Simmoneau, P.O. Box 386, Florence, Oreg. 97439
Filed Jun. 5, 1978, Ser. No. 912,244
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—106

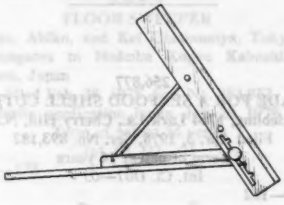


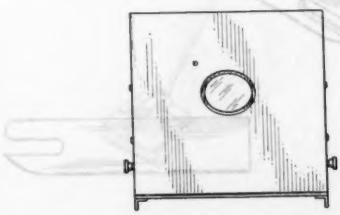
256,867
HOOK
Thomas J. Ryan, Terrace Park, Ohio, and Keith E. Ridgway, West Covina, Calif., assignors to Scovill Inc., Waterbury, Conn.
Filed Jan. 15, 1979, Ser. No. 3,222
Term of patent 14 years
Int. Cl. D23—*02;* D8—*08*
U.S. Cl. D6—122

256,868
CABINET FOR TOYS OR SIMILAR ARTICLE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Japan
Filed Apr. 28, 1978, Ser. No. 901,277
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

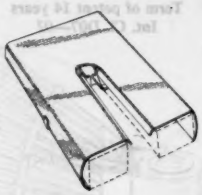


256,869
TABLE FOR RETOUCHING PHOTOGRAPHS
Joseph A. Arnone, 258 Briggs St., Syracuse, N.Y. 13208
Filed Aug. 9, 1978, Ser. No. 932,129
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—178

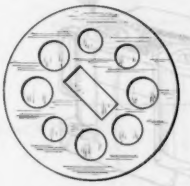




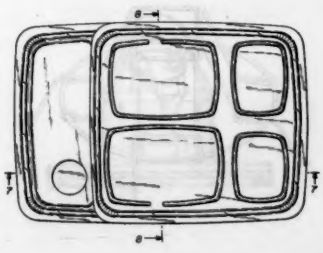
256,870
PILLOW COVER
Agnita Britzman, 1440 E. Fourth St., Long Beach, Calif. 90802
Filed Mar. 16, 1978, Ser. No. 887,194
Term of patent 7 years
Int. Cl. D6—*13*
U.S. Cl. D6—269



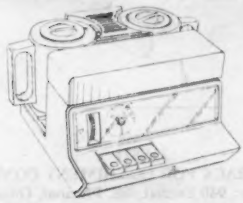
256,871
ROTATABLE RACK FOR CONDIMENT CONTAINERS
Delbert H. Snyder, 940 Everett Rd., Fremont, Ohio 43420
Filed Mar. 31, 1977, Ser. No. 783,432
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—2

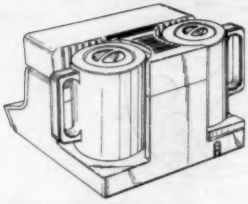


256,872
INSULATED FOOD SERVICE TRAY AND COVER THEREFOR
Edgar Otto, Scotch Plains, N.J., assignor to Therma-Tray Corporation, South Plainfield, N.J.
Filed Jan. 24, 1978, Ser. No. 871,860
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

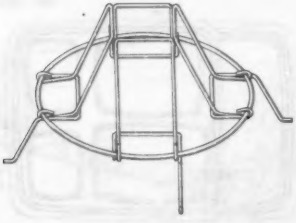


256,873
TEAMAKER
Ian G. Ettridge, Horsham, and Brian Draisey, Leatherhead, both of England, assignors to Goblin (B.V.C.) Limited Goblin Works, Leatherhead, England
Filed Aug. 29, 1977, Ser. No. 828,872
Claims priority, application United Kingdom, Mar. 1, 1977, 979083/77
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—62





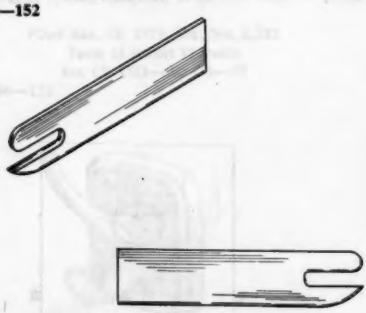
256,874
TOASTING RACK
Walter C. Rein, and Anthony H. Tygeson, both of 1801 Avenue of the Stars, Suite 200, Los Angeles, Calif. 90067
Filed Dec. 8, 1977, Ser. No. 858,673
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—92



256,875
OVEN RACK UTENSIL
Charles W. Slagle, IV, P.O. Box 79, Bethany Beach, Del. 19930
Filed Apr. 10, 1979, Ser. No. 28,834
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—99

256,876
CRAB MALLET
Charles W. Slagle, IV, P.O. Box 79, Bethany Beach, Del. 19930
Filed Apr. 10, 1979, Ser. No. 28,835
Term of patent 14 years
Int. Cl. D08—*02*; D07—*06*
U.S. Cl. D7—99

256,877
BLADE FOR A SEAFOOD SHELL CUTTER
Sidney A. Liebling, 1764 Lark La., Cherry Hill, N.J. 08003
Filed Apr. 3, 1978, Ser. No. 893,182
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—152



256,878

FLOOR SWEEPER

Akira Kubota, Abiko, and Kei Utsunomiya, Tokyo, both of Japan, assignors to Hukuba Kogyo Kabushiki Kaisha, Nagareyama, Japan

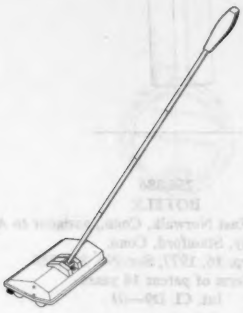
Filed Mar. 1, 1978, Ser. No. 882,896

Claims priority, application Japan, Jan. 27, 1978, 53-2389

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D7—175



256,879

FLOOR SWEEPER

Akira Kubota, Abiko, and Kei Utsunomiya, Tokyo, both of Japan, assignors to Hukuba Kogyo Kabushiki Kaisha, Nagareyama, Japan

Filed Feb. 28, 1978, Ser. No. 882,952

Claims priority, application Japan, Jan. 20, 1978, 53-1372

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D7—175

256,880

GARDEN RAKE

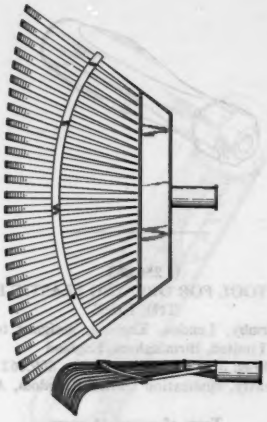
George F. Brock, Jr., 1025 Fallen Leaf Rd., Arcadia, Calif. 91006

Filed Jun. 15, 1978, Ser. No. 915,945

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—13



256,881

PORTABLE POWERED SANDER

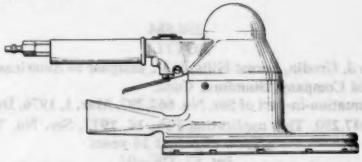
Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

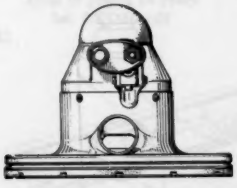
Filed Jan. 24, 1978, Ser. No. 872,049

Term of patent 14 years

Int. Cl. D08—*05;* D15—*09*

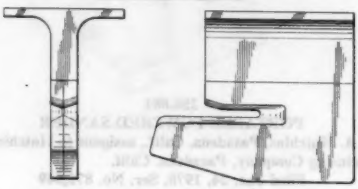
U.S. Cl. D8—62





256,882
SCREW DRIVER HANDLE
Erik C. Jansson, Enköping, Sweden, assignor to AB Bahco Verktyg, Enköping, Sweden
Filed Nov. 1, 1977, Ser. No. 847,682
Claims priority, application Sweden, May 2, 1977, 770986
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83

256,883
CUTTING TOOL FOR OPENING PLASTIC PACKS OR THE LIKE
Martin Wharmby, London, England, assignor to Dowler & Wakefield Limited, Birmingham, England
Filed Jun. 24, 1977, Ser. No. 809,662
Claims priority, application United Kingdom, Apr. 6, 1977, 979600/77
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



256,884
BOTTLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 662,297, Mar. 1, 1976, Des. Pat. No. 247,280. This application Feb. 14, 1977, Ser. No. 768,232
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

256,885
BOTTLE
Eugene P. DiScala, East Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 16, 1977, Ser. No. 834,013
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

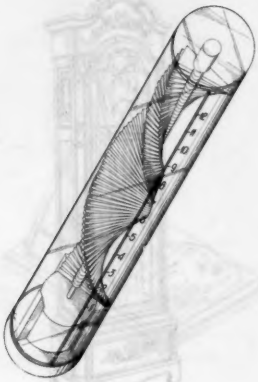
256,886
BOTTLE
Eugene P. DiScala, East Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 16, 1977, Ser. No. 834,035
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

256,887
DRINKING CUP LID
Kenneth M. Swade, 11035 Gross Dr., Parma, Ohio 44130, and John G. Bradner, 8812 Webster Rd., Strongsville, Ohio 44136
Filed May 1, 1978, Ser. No. 901,758
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—267

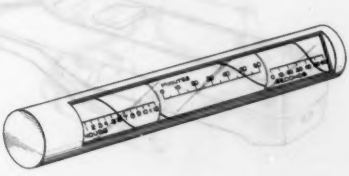
256,888
DRINKING CUP LID
Kenneth M. Swade, 11035 Gross Dr., Parma, Ohio 44130, and John G. Bradner, 8812 Webster Rd., Strongsville, Ohio 44136
Filed May 1, 1978, Ser. No. 901,759
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—267

256,889
DRINKING CUP LID
Kenneth M. Swade, 11035 Gross Dr., Parma, Ohio 44130, and John G. Bradner, 8812 Webster Rd., Strongsville, Ohio 44136
Filed May 1, 1978, Ser. No. 901,762
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—267

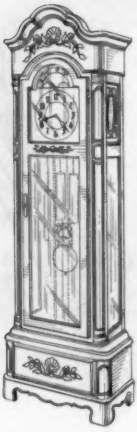
256,890
CLOCK
Stephen P. Diskin, 613 S. Ridgeley Dr., #202, Los Angeles, Calif. 90036
Filed Jul. 18, 1978, Ser. No. 925,889
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



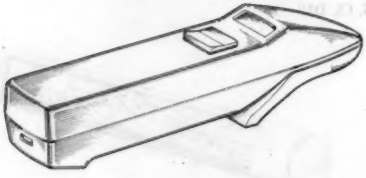
256,891
CLOCK
Stephen P. Diskin, 613 S. Ridgeley Dr., #202, Los Angeles, Calif. 90036
Filed Jul. 18, 1978, Ser. No. 925,960
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



256,892
FLOOR CLOCK
John Boukma, Grandville, Mich., assignor to Howard Miller Clock Company, Zeeland, Mich.
Filed Jun. 6, 1978, Ser. No. 913,124
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

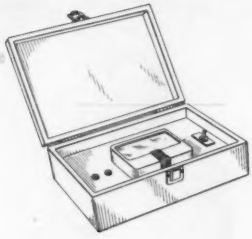


256,893
MEDICAL THERMOMETER
Bengt Nestell, Bjerred, and Lennart P. E. Persson, Lund, both of Sweden, assignors to Gambro AB, Lund, Sweden
Filed Jan. 3, 1979, Ser. No. 763
Claims priority, application Sweden, Jul. 3, 1978, 1656
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



256,894
TAPE RULE
Robert H. Bruno, Colebrook, Conn., assignor to The Stanley Works
Filed Sep. 18, 1978, Ser. No. 943,173
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72

256,895
METAL ALLOY ANALYZER
Robert J. LeBlanc, Rte. 4, Box 75-A, Gonzales, La. 70737
Filed Feb. 21, 1978, Ser. No. 879,682
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



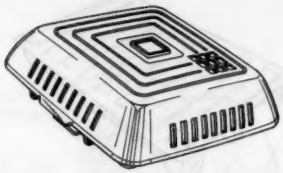
256,896
VOLT-OHM-AMMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instrument Works, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 843,641, Oct. 19, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,603
Claims priority, application Japan, Aug. 18, 1977, 52-32499; Sep. 22, 1978, 53-40044
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

256,897

SMOKE DETECTOR

Takeo Arima, Tokyo; Yoshinori Kaminaka, Sagamihara, and Kazumi Kikuchi, Tokyo, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,654
Claims priority, application Japan, Mar. 25, 1978, 53-11172
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

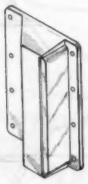


256,898

RAISED CURB MARKER OR SIMILAR ARTICLE

Leslie Barr, Barrington, Ill., assignor to Astro Optics Corporation

Filed Jul. 24, 1978, Ser. No. 927,016
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113



256,899

DECORATIVE CHAIN SEGMENT

Giovanni Mazzini, Arezzo, Italy, assignor to Emmegizeta Metalmeccanica Gori & Zucchi M.G.Z. S.p.A., Arezzo, Italy

Filed Jul. 18, 1978, Ser. No. 925,961
Claims priority, application Italy, Jan. 19, 1978, 11537/78[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—13

256,900

STATUETTE

Wayne Walter, R.D. 2, Box 180, Endicott, N.Y. 13760

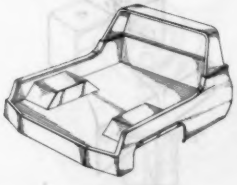
Filed Apr. 2, 1976, Ser. No. 673,121
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

256,901

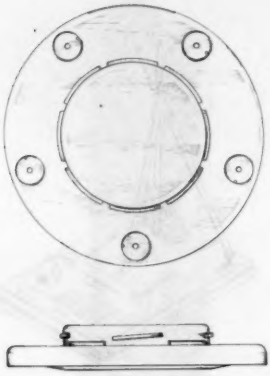
WRECKER BODY

Harold F. Carr, Jr., Hixson, Tenn., and David F. Humphries, Lafayette, Ga., assignors to Dover Corporation, Chattanooga, Tenn.

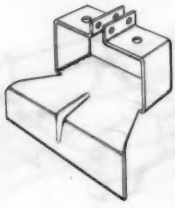
Filed Jun. 26, 1978, Ser. No. 918,940
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—14



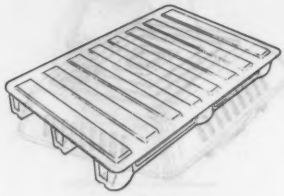
256,902
DOLLY PLATE FOR REFUSE CONTAINER
Dale T. Maza, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 1, 1978, Ser. No. 882,556
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31



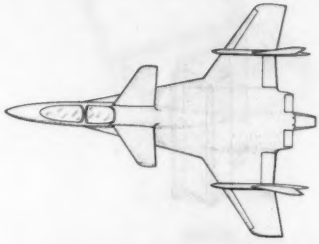
256,903
TRACK TIE STABILIZER
James W. Lawson, 7006 New Hampshire Trail, Crystal Lake, Ill. 60014
Filed May 17, 1978, Ser. No. 907,176
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—51



256,904
LOADING PALLET
Bengt G. Persson, Olofström, Sweden, assignor to AB Volvo, Gothenburg, Sweden
Filed Jul. 24, 1978, Ser. No. 927,749
Claims priority, application Sweden, Jan. 23, 1978, 0180/78
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53

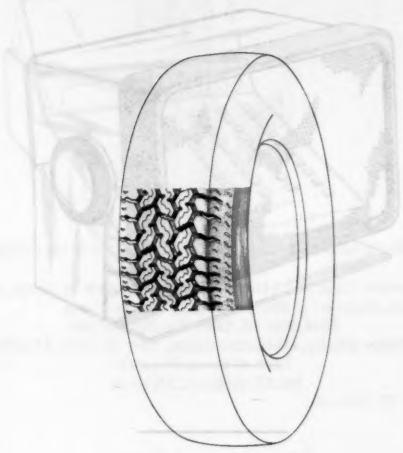


256,905
AIRCRAFT
Jean McComas, West Islip, and Gordon Rosenthal, Jericho, both of N.Y., assignors to Fairchild Industries, Inc.
Filed Nov. 1, 1977, Ser. No. 847,516
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78



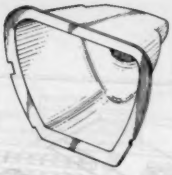
256,906
AIRCRAFT
John M. Conroy, P.O. Box 217, Camarillo, Calif. 93010
Filed Feb. 21, 1978, Ser. No. 879,693
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—80

256,907
TIRE
Andre E. J. Baus, Colmar-Berg, and Armand M. Menster, Luxembourg, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 15, 1978, Ser. No. 969,897
Claims priority, application United Kingdom, Jun. 20, 1978, 985116/78
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

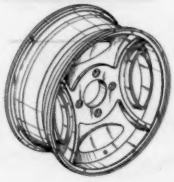


256,908
AUTOMOBILE BODY SECTION
James H. Muir, 598 Seabreeze Dr., Indialantic, Brevard County, Fla. 32903
Filed Dec. 11, 1978, Ser. No. 968,105
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

256,909
HELICOPTER BAGGAGE COMPARTMENT EXTENSION DEVICE
Ronald A. Leibin, 3305 S. Blue Ridge Ct., Westlake Village, Calif. 91361, and Stephen H. Crowe, Jr., 12671 Gladstone Ave., Sylmar, Calif. 91342
Filed Mar. 19, 1979, Ser. No. 22,035
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—157

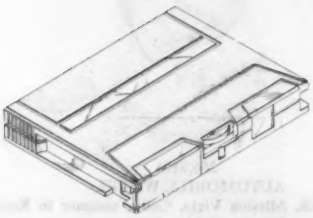


256,910
AUTOMOBILE WHEEL
Philip G. Patch, Mission Viejo, Calif., assignor to Keystone Products, Inc., Ontario, Calif.
Filed Jul. 13, 1979, Ser. No. 57,425
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

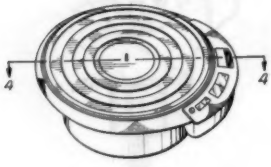


256,911
ELECTRIC LIGHT SOCKET
David C. Boyer, Chicago, and Frank V. Pliml, Jr., Arlington Heights, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 10, 1978, Ser. No. 895,214
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D13—25

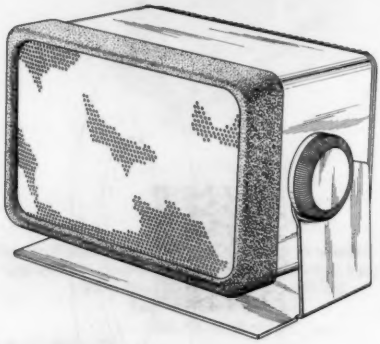
256,912
MINIATURE TAPE CARTRIDGE
Roy V. Lonberger, Campbell, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.
Filed Jun. 5, 1978, Ser. No. 912,565
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—11



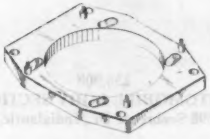
256,913
TURNTABLE FOR RECORD PLAYER
Tomihiro Kaneko, Sakae, Japan, assignor to Nippon Columbia Co. Ltd., Tokyo, Japan
Filed Sep. 19, 1977, Ser. No. 834,379
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17

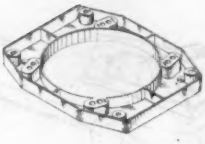


256,914
LOUDSPEAKER
Dieter Rams, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 16, 1978, Ser. No. 878,578
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 738648
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



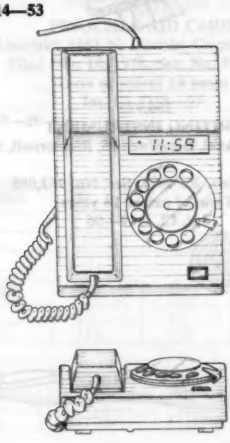
256,915
SPEAKER MOUNT ADAPTOR PLATE
Ronald Needleman, Duxbury, Mass., assignor to Audiovox Corporation, Hauppauge, N.Y.
Filed Mar. 3, 1978, Ser. No. 883,339
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—37



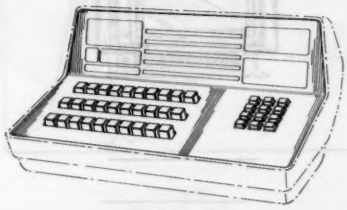


256,916
COMPUTER CONSOLE
Joanne L. Gindek, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Apr. 17, 1978, Ser. No. 896,784
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45

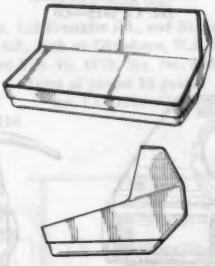
256,917
COMBINATION TELEPHONE INSTRUMENT
John De Filippis, South Amboy, and Clifford W. Shackelton, Keyport, both of N.J., assignors to International Telephone and Telegraph Corporation
Filed Jan. 25, 1978, Ser. No. 872,290
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



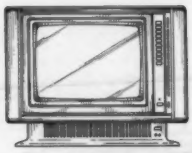
256,918
FRONT PANEL FOR A TELEPHONE CONTROL CONSOLE
Brian K. White, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Aug. 31, 1978, Ser. No. 938,734
Claims priority, application Canada, Mar. 6, 1978, 0603785
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



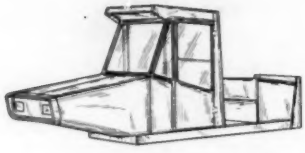
256,919
TELEPHONE CONTROL CONSOLE
Brian K. White, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Aug. 31, 1978, Ser. No. 938,735
Claims priority, application Canada, Mar. 6, 1978, 0603786
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



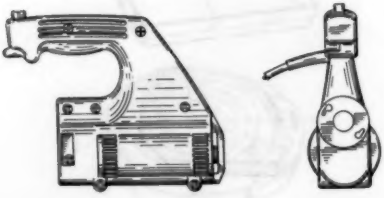
256,920
TELEVISION RECEIVER
Hiroshi Takashima; Hiroshi Oi, and Michio Ogawa, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 16, 1978, Ser. No. 878,487
Claims priority, application Japan, Aug. 24, 1977, 52/33903
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



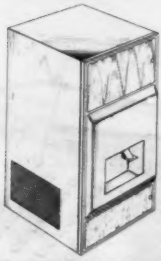
256,921
TRACTOR BODY
Patrick Kuhn, Bismarck, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.
Filed May 31, 1978, Ser. No. 911,254
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23



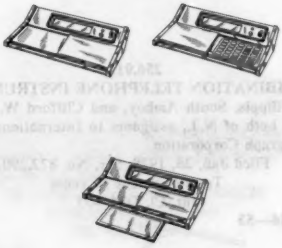
256,922
MOTOR HOUSING AND HANDLE FOR A PORTABLE BAG CLOSING SEWING MACHINE
Guenter J. Haak, Stuttgart, and Gernot H. Nedoschinsky, Ditzingen, both of Fed. Rep. of Germany, assignors to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany
Filed Apr. 20, 1978, Ser. No. 898,239
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70



256,923
ICE DISPENSER
James N. Mullins, Jr., 3501 Biway St., Forth Worth, Tex. 76114
Filed Jul. 7, 1978, Ser. No. 922,795
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—80



256,924
COMBINED ELECTRONIC CALCULATING MACHINE AND CLOCK
Yoshihisa Ohie, and Masafumi Yamagami, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed May 16, 1978, Ser. No. 907,249
Claims priority, application Japan, Nov. 16, 1977, 52/45704
Term of patent 14 years
Int. Cl. D10—*01;* D18—*01*
U.S. Cl. D18—2



256,925
WRITING INSTRUMENT
Petr Postrehovsky-Axel, Bürgliweg 15, Richterswil, Switzerland (8805)
Filed Nov. 20, 1978, Ser. No. 962,088
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

256,926

PEN CAP OR SIMILAR ARTICLE

Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan

Filed Nov. 2, 1978, Ser. No. 957,039

Claims priority, application Japan, May 11, 1978, 53/19155

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—57

256,927

PINOCHLE AID CARD

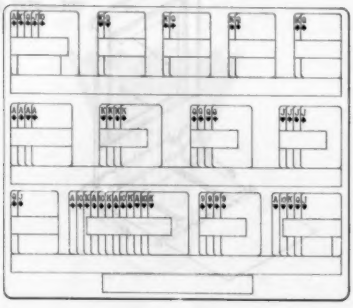
Robert R. Kowalski, 1161 N. Lincoln, Casper, Wyo. 82601

Filed Oct. 16, 1978, Ser. No. 951,674

Term of patent 14 years

Int. Cl. D19—*07*

U.S. Cl. D19—59



256,928

DECAL OR THE LIKE

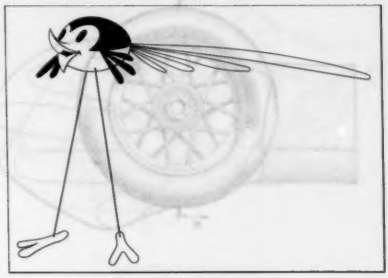
Hubert Ballay, 22, rue Ballu, 75009 Paris, France

Filed Jan. 16, 1979, Ser. No. 3,872

Term of patent 14 years

Int. Cl. D20—*99*

U.S. Cl. D20—11



256,929

TOY HOUSE

Gloria Caranica, Orchard Park, and Karen D. Marconi, West Falls, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,847

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—114

256,930

DOLL HOUSE

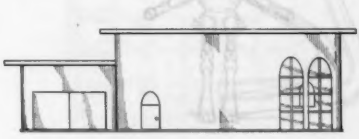
James T. Hanley, 121 Franklin Rd., and Richard R. Smith, 120 Pennsylvania Rd., both of Glassboro, N.J. 08028

Filed Feb. 10, 1978, Ser. No. 876,856

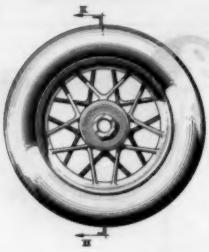
Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—114

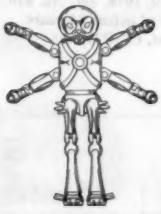


256,931
TOY WHEEL
Bruce N. Smith, Seabrook, N.H., assignor to Spherex, Inc.
Filed Jun. 12, 1978, Ser. No. 915,061
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—141



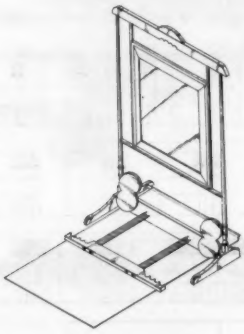
256,932
TOY FIGURE
Lawrence T. Jones, Playa Del Rey, and Robert S. Lee, Westlake, both of Calif., assignors to California R & D Center
Filed Feb. 1, 1979, Ser. No. 8,681
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

256,933
TOY FIGURE
Lawrence T. Jones, Playa Del Rey, and Robert S. Lee, Westlake, both of Calif., assignors to California R & D Center
Filed Feb. 1, 1979, Ser. No. 8,741
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166



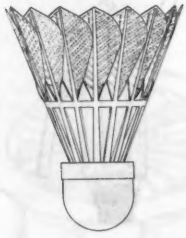
256,934
TOY FIGURE
Lawrence T. Jones, Playa Del Rey, and Robert S. Lee, Westlake, both of Calif., assignors to California R & D Center
Filed Feb. 1, 1979, Ser. No. 8,784
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

256,935
PHYSICAL EXERCISER
Isidro Morera, 1054 Thirty-first St., NW., Washington, D.C. 20007
Filed Dec. 23, 1977, Ser. No. 863,973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195

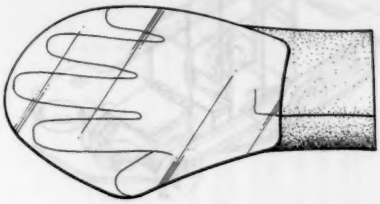


256,936
SHUTTLECOCK
Frank W. Popplewell, Saffron Walden, England, assignor to Dunlop Limited, London, England
Filed Oct. 27, 1978, Ser. No. 955,363
Claims priority, application United Kingdom, May 20, 1978, 984687/78
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—207

256,937
SHUTTLECOCK
Frank W. Popplewell, Saffron Walden, England, assignor to Dunlop Limited, London, England
Filed Oct. 27, 1978, Ser. No. 955,384
Claims priority, application United Kingdom, May 20, 1978, 984685/78
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—207

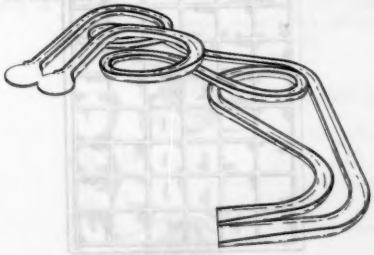


256,938
BALL PADDLE FOR TABLE GAME
Bertrand Castelli, c/o Myron Salisian, 251 S. Lake Ave., Suite 701, Pasadena, Calif. 91101
Filed Sep. 25, 1978, Ser. No. 945,183
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

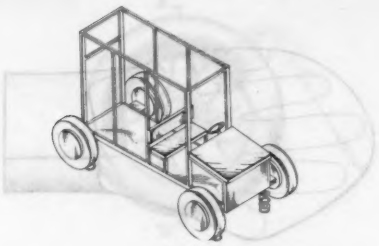


256,939
BALL PADDLE FOR TABLE GAME
Bertrand Castelli, c/o Myron Salisian, 251 S. Lake Ave., Suite 701, Pasadena, Calif. 91101
Filed Sep. 25, 1978, Ser. No. 945,184
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

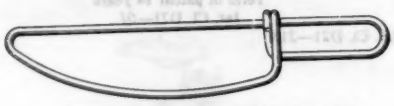
256,940
WATER SLIDE OR SIMILAR ARTICLE
John C. Allen, 3rd, Philadelphia, Pa., assignor to S. B. Ramagosa & Sons, North Wildwood, N.J.
Filed May 8, 1978, Ser. No. 903,973
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244



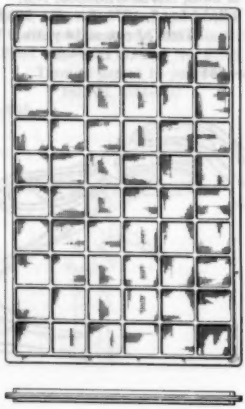
256,941
PLAYGROUND APPARATUS
Ray G. Manus, Rte. 5, Box 104, Lincolnton, N.C. 28092
Filed Oct. 2, 1978, Ser. No. 947,708
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—250



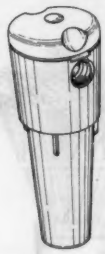
256,942
SNAP FASTENER
Robert L. McMickle, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Dec. 11, 1978, Ser. No. 968,106
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23



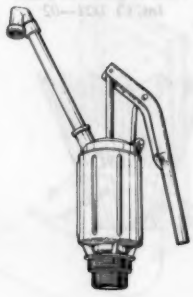
256,943
FILTER
Denis Angelinetta, 57 Mount Ephraim La., London, SW16, England
Filed Mar. 9, 1978, Ser. No. 885,105
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



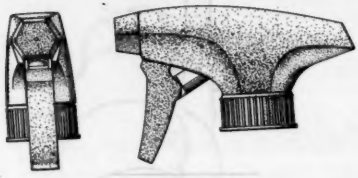
256,944
WATER FILTER
William L. Fox, Jr., Libertyville, Ill., assignor to Brunswick Corporation, Skokie, Ill.
Filed Apr. 24, 1978, Ser. No. 899,114
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



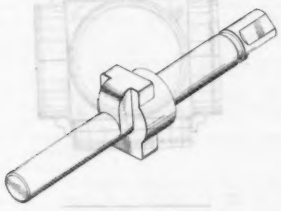
256,945
DRUM PUMP
Karl Willis, Lymm, England, assignor to Le-Cas Limited, Warrington, England
Filed Dec. 13, 1978, Ser. No. 969,196
Claims priority, application United Kingdom, Jun. 27, 1978, 985208/78
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—14



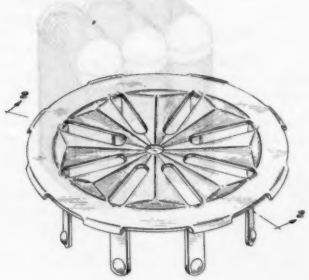
256,946
SPRAY PUMP
Paul R. Campbell, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 25, 1978, Ser. No. 937,027
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



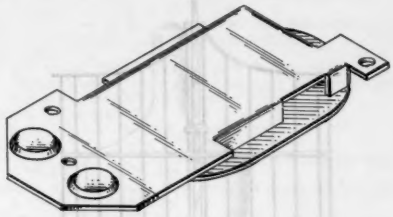
256,947
CONTROL SHAFT FOR A VALVE
Ralph Terrazas, La Mirada, Calif., assignor to California Screw Corporation, Paramount, Calif.
Filed Jun. 13, 1978, Ser. No. 915,170
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



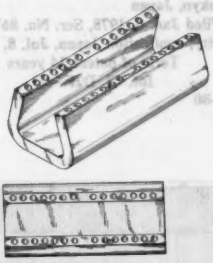
256,948
DRAIN COVER
Donald J. Boersma, Country Club Hills, Ill., assignor to Iodon Incorporated, Country Club Hills, Ill.
Filed Sep. 13, 1978, Ser. No. 942,172
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



256,949
HOUSING FOR AN ELECTRIC HEATING ELEMENT
Yogesh P. Patel Murfreesboro, Tenn., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 2, 1977, Ser. No. 847,729
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



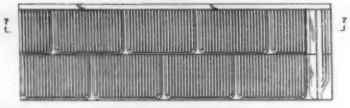
256,950
ORTHODONTIC WIRE HOLDER
Arthur J. Sable, Boulder, Colo., assignor to Rocky Mountain Associates International, Inc., Denver, Colo.
Filed Mar. 29, 1978, Ser. No. 891,486
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—10



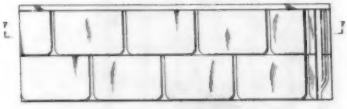
256,951
DUAL STETHOSCOPE MICROPHONE
Derek R. Allen, 27 Point Loma, Corona del Mar, Calif. 92625
Filed Jan. 26, 1978, Ser. No. 872,598
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—20

256,952
PATIO DOOR GUARD GATE
Jeanette V. Domanski, 8180 S. 28th St., Franklin, Wis. 53132
Filed Jan. 3, 1978, Ser. No. 866,763
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—50

256,953
ROOFING PANEL
Kazuharu Morita, Tokyo, Japan, assignor to Rainbow Metal Co., Ltd., Tokyo, Japan
Filed Jan. 6, 1978, Ser. No. 867,540
Claims priority, application Japan, Jul. 8, 1977, 52-26633
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—80

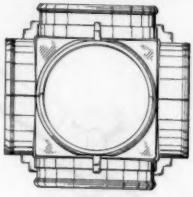


256,954
ROOFING PANEL
Kazuharu Morita, Kodairashi, Japan, assignor to Rainbow Metal Co., Ltd., Tokyo, Japan
Filed Jan. 6, 1978, Ser. No. 867,626
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—80

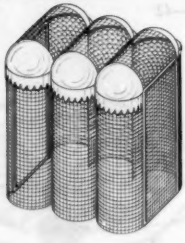


256,955
DENTAL FLOSS HOLDER
Elmer T. Rogers, 1195 Lindberg Dr., Deptford, N.J. 08096
Filed Feb. 16, 1978, Ser. No. 878,242
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—64

256,956
PASSAGEWAY JOINT FOR A SMALL ANIMAL HABITAT OR THE LIKE
James B. Stewart, Randolph Township, Morris County, and John A. Molnar, Metuchen, both of N.J., assignors to Metaframe Corporation, Elmwood Park, N.J.
Filed Jul. 11, 1977, Ser. No. 814,478
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



256,957
ANIMAL HABITAT
Fritz Jüstl, Starkenburgring 5, D-6057 Dietzenbach, Fed. Rep. of Germany
Filed Mar. 29, 1978, Ser. No. 891,354
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 510057
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

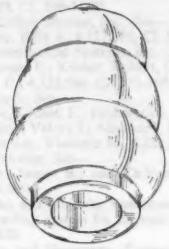


256,958

PET TOY

Joseph P. Markham, Denver, Colo., assignor to Tufftoys, Inc., Denver, Colo.

Filed Jun. 15, 1978, Ser. No. 916,308
Term of patent 14 years
Int. Cl. D30—99
U.S. Cl. D30—99



256,959

ULTRASONIC PEST REPELLING DEVICE

Lester B. Hall, Kenmore, N.Y., assignor to Gary Lester Hall, Kenmore, N.N.Y.

Filed Jun. 7, 1978, Ser. No. 913,391
Term of patent 14 years
Int. Cl. D99—99
U.S. Cl. D99—99

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstroom Osakeyhtio: *See*—
Gullichsen, Johan; and Sundman, Frey V., 4,222,818, Cl. 162-66.000.

A. E. Staley Manufacturing Company: *See*—
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., 4,223,129, Cl. 536-4.000.

AAA Office Coffee Service, Inc.: *See*—
Castleberry, Billy J., 4,222,320, Cl. 99-281.000.

ABA Electromechanical Systems, Inc.: *See*—
Allen, Donnie E.; Kilmer, Robert; Guy, Thomas L.; and Fosnow, Wesley C., 4,222,564, Cl. 273-369.000.

Abasheev, Jury L: *See*—
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.

Abbott Laboratories: *See*—
McAlpine, James B.; and DeVault, Robert L., 4,223,024, Cl. 424-180.000.

Abe, Fumiyuki; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Cooling system for internal combustion engine. 4,222,353, Cl. 123-41.120.

Abe, Shintaro; and Haganuma, Tomoyuki, to Ricoh Company, Ltd. Word processor. 4,223,393, Cl. 364-900.000.

Abe, Toshihito: *See*—
Ota, Isamu; and Abe, Toshihito, 4,222,357, Cl. 123-568.000.
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.

Abel, Allen J., to Minnesota Mining and Manufacturing Company. Single disk cartridge. 4,222,487, Cl. 206-444.000.

Abmayr, David W.: *See*—
Rozell, James O.; and Abmayr, David W., 4,223,381, Cl. 364-200.000.

Abrams, Martin T., to AES Technology Systems, Inc. Opening of envelope with darkened edges. 4,222,216, Cl. 53-492.000.

Achener, Pierre Y., to Varian Associates, Inc. Pulse damper for high-pressure liquid chromatography. 4,222,414, Cl. 138-30.000.

Acker, Loren C., to Engineering & Research Associates, Inc. Solar pool heater. 4,222,366, Cl. 126-415.000.

Ackerman, Bernard. Drip preventive spout particularly adapted for use in pouring wines. 4,222,504, Cl. 222-569.000.

Adachi, Ryoichi; and Hayashi, Toshihito, to Phillips Petroleum Company. Apparatus for producing granules from fine powder. 4,222,727, Cl. 425-222.000.

Adam, Jakob, to Siemens Aktiengesellschaft. Room conditioning lamp. 4,222,316, Cl. 98-40.0DL.

Adam, Jerome H.: *See*—
Gray, David A.; Sivertsen, Marvin L.; Adam, Jerome H.; and Prendergast, John F., Sr., 4,223,222, Cl. 250-363.00S.

Adams, Albert E., to Combustion Linings Limited. Linings for furnaces. 4,222,338, Cl. 110-336.000.

Adams, Frederick J., to Cam Gears Limited. Power assisted gear systems. 4,223,254, Cl. 318-2.000.

Adams, James Y.: *See*—
Wardman, John C.; and Adams, James Y., 4,222,241, Cl. 60-641.000.

Adamson, Arthur P., to General Electric Company. Dual fan engine for VTOL pitch control. 4,222,234, Cl. 60-226.00R.

Adamson, Arthur P.; and Sprunger, Elmore V., to General Electric Company. Variable cycle engine. 4,222,235, Cl. 60-226.00R.

Adler, Alan J. Boomerang. 4,222,573, Cl. 273-426.000.

Adria Laboratories Inc.: *See*—
Wolgemuth, Richard L., 4,223,109, Cl. 525-327.000.

Aerospace Corporation, The: *See*—
Harrigan, William C., Jr.; Flowers, Robert H.; and Hudson, Silas P., 4,223,075, Cl. 428-610.000.

AES Technology Systems, Inc.: *See*—
Abrams, Martin T., 4,222,216, Cl. 53-492.000.

AGA Aktiebolag: *See*—
Wiklund, Klas R., 4,223,300, Cl. 340-196.000.

Agatahama, Shunichi; Masaki, Akio; and Bando, Yoshihide, to Omron Tateisi Electronics Co. Electromagnetic device of the flat package type. 4,223,290, Cl. 335-229.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Leblanc, Michel; Laneres, Jacques; and Perrin, Jean, 4,222,261, Cl. 73-29.000.

Agency of Industrial Science & Technology: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.

AGFA-Gevaert, A.G.: *See*—
Leuchter, Jurgen, 4,222,657, Cl. 354-324.000.

Ahmed, Adel A. A., to RCA Corporation. Relaxation oscillator including an SCR and having switch means for interrupting current flow therethrough. 4,223,280, Cl. 331-111.000.

Ahmed, Adel A. A., to RCA Corporation. SCR Relaxation oscillator with current amplifier in its gate circuit. 4,223,281, Cl. 331-111.000.

Aihara, Sukeji: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.

Air Master Corporation: *See*—
Yanessa, Silvio F., 4,222,201, Cl. 49-189.000.

Air Products and Chemicals, Inc.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,223,139, Cl. 544-171.000.
Hansel, John H.; Linton, Robert G.; and Stanger, Charles W., Jr., 4,222,856, Cl. 208-120.000.
Thorogood, Robert M., 4,222,756, Cl. 62-13.000.

Airhart, Tom P., to Atlantic Richfield Company. Bidirectional ground coupling means for inclined seismic source. 4,222,454, Cl. 181-117.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Takeshita, Hiroshi; Nagashima, Takashi; and Kondo, Hiroyuki, 4,222,613, Cl. 303-6.00C.

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Hentschel, Peter; Zengel, Hans; and Bergfeld, Manfred, 4,223,145, Cl. 546-107.000.
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Akzona Incorporated: *See*—
de Winter, Max S., 4,223,030, Cl. 424-242.000.
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Alaimo, Robert J.; Sheffer, James B.; and Millner, Ozra E., Jr., to Morton-Norwich Products, Inc. [[(4-Aminophenyl)sulfonyl]amino]-phenyl phosphorodiamidates. 4,222,948, Cl. 260-397.70R.

Alan Shelton Limited: *See*—
Shelton, William E. A., 4,222,264, Cl. 73-160.000.

Albany International Corp.: *See*—
Parker, Roy B., 4,222,806, Cl. 156-213.000.

Albinger, Harry, Jr., to General Electric Company. Alarm devices for interconnected multi-device systems. 4,223,303, Cl. 340-531.000.

Albritton, James W. Delayed power interruption alarm. 4,223,307, Cl. 340-656.000.

Alcan Research and Development Limited: *See*—
Bryson, Neil B., 4,222,431, Cl. 164-89.000.

Alcaraz, Anthony J.: *See*—
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Alden Research Foundation: *See*—
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Alderman, Robert J., to Butler Manufacturing Company. Insulated roof. 4,222,212, Cl. 52-749.000.

Aldrich, Joe L., to Keystone International, Inc. Material level detector circuit. 4,222,267, Cl. 73-304.00C.

Alford, Andrew. Stacked arrays for broadcasting elliptically polarized waves. 4,223,315, Cl. 343-742.000.

Alford, John A., to Westvaco Corporation. Treatment of rosin. 4,222,933, Cl. 260-107.000.

Alier-Screen, Inc.: *See*—
Brennan, Louis G., 4,222,392, Cl. 128-743.000.

Alikhashkin, Vladimir A.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.

Allan, John L. H.; and Patnaik, Birendra K., to Dart Industries Inc. Polyolefin catalyst. 4,222,895, Cl. 252-429.00B.

Allan, John L. H.: *See*—
Bengali, Ajay M.; Zuendt, Richard F.; Allan, John L. H.; and Readio, Philip D., 4,222,779, Cl. 106-14.120.

Allen, Arnold R., to Sperry Corporation. Gyroscope rate range switching and control system. 4,222,270, Cl. 73-504.000.

Allen-Bradley Company: *See*—
Moffitt, Jerry T.; and Bulgrin, Robert W., 4,223,294, Cl. 338-122.000.

Allen, Donnie E.; Kilmer, Robert; Guy, Thomas L.; and Fosnow, Wesley C., to ABA Electromechanical Systems, Inc. Automated scoring target system. 4,222,564, Cl. 273-369.000.

Allied Chemical Corporation: *See*—
Novotny, Miroslav; and Anderson, Lowell R., 4,223,001, Cl. 423-655.000.

Alliegro, Richard A.; and Stark, Ronald A., to Norton Company. Refractory ramming mix containing aluminum powder for metal melting furnaces. 4,222,782, Cl. 106-57.000.

Allis-Chalmers Corporation: *See*—
Johnston, David K.; and Stuber, Michael R., 4,222,395, Cl. 130-27.00T.
Moe, Richard G., 4,222,218, Cl. 56-104.000.

Allsen, Philip E.; and Hafen, Brent Q., to Vitalograph (Ireland) Limited. Pedometer devices. 4,223,211, Cl. 235-92.0DN.

Allweil, Avraham. Portable shelter. 4,222,401, Cl. 135-1.00R.

Alphen, Jacques M. Headlight systems for motor cycles. 4,223,375, Cl. 362-72.000.

Alps Electric Co., Ltd.: *See*—
Iwasaki, Sadayoshi; and Miyata, Hiroyasu, 4,223,193, Cl. 200-308.000.

Alterton, Lloyd E.: *See*—
Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., 4,222,675, Cl. 400-474.000.

Altscher, Siegfried: *See*—
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Alumax Inc.: *See*—
Miller, John J., 4,222,841, Cl. 204-247.000.

Aluminum Company of America: *See*—
Dawless, Robert K.; and Jacobs, Stanley C., 4,222,830, Cl. 204-67.000.
Hawkins, Ronald G., 4,223,176, Cl. 174-42.000.
King, Eugene O., Jr.; and Stewart, D. Fred, 4,222,254, Cl. 72-8.000.

Aluotto, Patrick F.; and Drees, Paul A., to Inmont Corporation. Aqueous organic coatings for metal surfaces. 4,222,919, Cl. 260-29.40R.

ALZA Corporation: *See*—
Michaels, Alan S., 4,223,061, Cl. 428-215.000.

Amada Company, Limited: *See*—
Sawamura, Mitsuyoshi, 4,222,295, Cl. 83-169.000.

Amada, Eiichi; and Ohnishi, Makoto, to Hitachi, Ltd. Recursive digital filter having means to prevent overflow oscillation. 4,223,389, Cl. 364-724.000.

Ameduri, Gene J.: *See*—
Rost, Duane F.; and Ameduri, Gene J., 4,222,368, Cl. 126-438.000.

Amemiya, Kunio; Nishimura, Motohiro; and Kimura, Yoichi, to Unitika Ltd. Anti-graying fabrics of synthetic polyester fibers and process for producing same. 4,223,065, Cl. 428-272.000.

Amerace Corporation: *See*—
Reed, Anthony, 4,222,625, Cl. 339-143.00C.

American Electronics, Inc.: *See*—
Beaver, Richard C., 4,222,648, Cl. 354-171.000.
Gunderson, Norman R., 4,222,650, Cl. 354-173.000.

American Home Products Corporation: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,223,151, Cl. 546-269.000.

American Hospital Supply Corporation: *See*—
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American Loose Leaf Corporation: *See*—
Luogameno, Felix, 4,222,679, Cl. 402-75.000.

American Medical Systems, Inc.: *See*—
Burton, John H., 4,222,377, Cl. 128-1.00R.

American National Red Cross: *See*—
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American Solar Systems, Inc.: *See*—
Dorian, Mark E.; and Nelson, David H., 4,223,214, Cl. 250-203.00R.

American Tinnitus Association: *See*—
Hocks, Robert W.; and Vernon, Jack A., 4,222,393, Cl. 128-746.000.

AMP Incorporated: *See*—
Hollyday, Robert D.; and Glover, Douglas W., 4,222,626, Cl. 339-147.00R.

Anaconda Wire and Cable Company: *See*—
Stauffer, John D.; Arnaudin, Edwin H., Jr.; and Chrisman, Willis L., 4,222,980, Cl. 264-85.000.

Anderle, Joseph A., to Levolor Lorentzen, Inc. Holder for supporting a valance at a venetian blind head. 4,222,156, Cl. 24-73.00B.

Andersen, Erik. Sausage peeling apparatus. 4,222,150, Cl. 17-1.00F.

Anderson, Ernest E.: *See*—
Kouloumbini, Aliki-Niki; and Anderson, Ernest E., 4,222,510, Cl. 225-94.000.

Anderson, Greenwood & Co.: *See*—
Slaughter, Lomis, Jr., 4,222,408, Cl. 137-518.000.

Anderson, Lowell R.: *See*—
Novotny, Miroslav; and Anderson, Lowell R., 4,223,001, Cl. 423-655.000.

Anderson, Martin L.: *See*—
Christy, Ronald I.; and Anderson, Martin L., 4,222,296, Cl. 83-459.000.

Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Method for control of San Jose scale. 4,223,012, Cl. 424-84.000.

Anderson, Verner; Logan, David J.; and Wood, Kenneth O., to Gulf & Western Corporation. Apparatus for cutting cigar wrappers from natural tobacco leaves. 4,222,396, Cl. 131-105.000.

Andersson, Arne, to Klippan Automotive Products AB. Seat belt condition indicator. 4,222,609, Cl. 297-468.000.

Andersson, Par M.; and Rosberg, Bengt A., to Tetra Pak International AB. Filler pipe for packing machines. 4,222,417, Cl. 141-392.000.

Ando, Yujiro: *See*—
Tsukada, Syusei; Ando, Yujiro; and Tanaka, Hiroshi, 4,222,776, Cl. 430-55.000.

Andoskin, Vladimir N.: *See*—
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.

Andres, Rudolf: *See*—
Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, 4,222,603, Cl. 296-146.000.

Andrews, Robert E.: *See*—
Spence, Kemet D.; and Andrews, Robert E., 4,223,007, Cl. 424-16.000.

Ang, Leoncio T.; Walker, Bertice E., Jr.; and Weber, Robert E., to Bendix Corporation, The. Low voltage inhibit for adaptive braking system. 4,222,615, Cl. 303-92.000.

Angstadt, Howard P.: *See*—
Butte, Walter A., Jr.; Murtaugh, William J.; and Angstadt, Howard P., 4,222,961, Cl. 260-563.00D.

Anritsudenki Kabushikigaisha: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.

Anthes Imperial Limited: *See*—
Shunta, Richard F., 4,222,751, Cl. 55-204.000.

Antonaccio, Joseph C.; and Verreau, Bernard J., to NCR Corporation. Distributed multiprocessor communication system. 4,223,380, Cl. 364-200.000.

Antonsson, Erik K.; and Flowers, Woodie C., to Massachusetts Institute of Technology. Femoral component hip joint prosthesis extractor. 4,222,382, Cl. 128-303.00R.

Antosz, Frederick J.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,223,092, Cl. 435-55.000.

Aoki, Hideki: *See*—
Tomonaga, Atsushi; and Aoki, Hideki, 4,222,128, Cl. 3-1.900.

Aparov, Adrian B.: *See*—
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.

Arabian, Khachik. Clock dial. 4,222,227, Cl. 368-27.000.

Aramaki, Seiichi: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.

Arcanum Corporation: *See*—
Caswell, Bruce F., 4,222,981, Cl. 264-117.000.

Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; and Scarponi, Ugo, to Farmitalia Carlo Erba S.p.A. 4,5,6,7-Tetrahydroimidazo-[4,5-c]-pyridine derivatives. 4,223,146, Cl. 546-118.000.

Arco Polymers, Inc.: *See*—
Boyle, Robert J., 4,223,066, Cl. 428-306.000.

Arctic Enterprises, Inc.: *See*—
Boelter, Stuart R., 4,222,698, Cl. 414-477.000.
Fixsen, Hubert; and Skime, Roger, 4,222,453, Cl. 180-193.000.

Argo, Wesley B.; Crocker, Burton B.; and Sisler, Charles C., to Monsanto Company. Electrostatically augmented fiber bed and method of using. 4,222,748, Cl. 55-6.000.

Argus Chemical Corporation: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,222,931, Cl. 260-45.8NZ.

Arima, Takeo, to Hochiki Corporation. Single station type ionization smoke sensor. 4,223,305, Cl. 340-629.000.

Arlt, Dieter: *See*—
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, 4,223,147, Cl. 546-224.000.

Armand, Michel; Brec, Raymond; and Le Mehaute, Alain, to Compagnie Generale d'Electricite. Lithium electric cell. 4,223,078, Cl. 429-194.000.

Armco Inc.: *See*—
Neiheisel, Gary L.; and Hoover, Bradley R., 4,223,346, Cl. 358-106.000.

Armour Pharmaceutical Company: *See*—
Rubino, Andrew M.; Jones, John L.; and Bretschneider, Edward S., 4,223,010, Cl. 424-66.000.

Armstrong, Clifford M., to Lucas industries Limited. Crankshaft position transducer system. 4,222,263, Cl. 73-116.000.

Armstrong Cork Company: *See*—
Bohrn, Walter J.; and Moggio, William A., 4,222,740, Cl. 8-448.000.
Kent, Raymond C.; and Haines, Charles, Jr., 4,222,803, Cl. 156-85.000.

Arnaudin, Edwin H., Jr.: *See*—
Stauffer, John D.; Arnaudin, Edwin H., Jr.; and Chrisman, Willis L., 4,222,980, Cl. 264-85.000.

Arnett, Perry J. Accuracy device for semi-automatic pistols. 4,222,308, Cl. 89-163.000.

Arnold, Pitt W.: *See*—
Davidson, Allen L.; Arnold, Pitt W.; and Stern, Morton, 4,223,310, Cl. 343-100.0CS.

Arnoldi, Detlef: *See*—
Kleemann, Axel; Schalke, Peter; and Arnoldi, Detlef, 4,222,956, Cl. 260-465.400.

Asahi Giken Kogyo Kabushiki Kaisha: *See*—
Suyama, Itaru, 4,222,768, Cl. 75-12.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,222,394, Cl. 128-773.000.
Tano, Eiichi; and Kawasaki, Masahiro, 4,222,644, Cl. 354-23.00D.
Urano, Fumio; and Kobayashi, Takumi, 4,222,651, Cl. 354-214.000.

Asano, Kenji: *See*—
Sekiguchi, Yoshikazu; and Asano, Kenji, 4,222,575, Cl. 277-59.000.

Ashworth, Denis H., to Simon Engineering Dudley Ltd. Hydraulic platforms. 4,222,457, Cl. 182-2.000.

Assouline, Georges; Hareng, Michel; and Leiba, Eugene, to Thomson-CSF. Liquid crystal mixture and its application to optical modulation. 4,222,636, Cl. 350-350.00R.

Astec Industries, Inc.: *See*—
Brock, James D., 4,222,498, Cl. 222-58.000.

Atlantic Cement Company, Inc.: *See*—
Hard, Thomas; and Swingle, Ronald, 4,222,459, Cl. 182-152.000.

Atlantic Richfield Company: *See*—
Airhart, Tom P., 4,222,454, Cl. 181-117.000.
Kesling, Haven S., Jr., 4,222,959, Cl. 260-562.00R.

Atlas Foundry & Machine Co.: *See*—
Reimer, Richard A., 4,223,306, Cl. 340-650.000.

Atsumi, Senji; and Wada, Shigetaka, to NGK Insulators, Ltd. Barium titanate series ceramics having a positive temperature coefficient of electric resistance. 4,222,783, Cl. 106-73.320.

Auborn, James J., to Bell Telephone Laboratories, Incorporated. Cell and fuel cell electrodes having poly(phosphazene) binder. 4,223,080, Cl. 429-194.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Ruf, Max, 4,222,715, Cl. 417-310.000.

August, Peter; Hechtl, Wolfgang; and Schmidlkofer, Richard, to Wacker-Chemie GmbH. Impression compositions and process for preparing impressions. 4,222,983, Cl. 264-220.000.

August, Peter: *See*—
Kreis, Gerhard; and August, Peter, 4,222,951, Cl. 556-478.000.

August, Rudolf R.: *See*—
Quick, William H.; August, Rudolf R.; James, Kenneth A.; Strahan, Virgil H., Jr.; and Nichols, Donald K., 4,223,226, Cl. 250-458.000.

Austin, Carl F., to United States of America, Navy. Underwater cutting device. 4,222,329, Cl. 102-24.0HC.

Avila, Maximo L.; and Cortez, Edwin L. Particle separator. 4,222,858, Cl. 209-11.000.

Axen, Udo F., to Upjohn Company, The. 6-Keto-ωaryl-PGE$_1$ compounds. 4,223,157, Cl. 560-53.000.

Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Porous abradable shroud with transverse partitions. 4,222,706, Cl. 415-116.000.

B. F. Goodrich Company, The: *See*—
Martindale, Troy E., 4,222,323, Cl. 100-12.000.

Babcock, Robert L.: *See*—
Gauthier, William D.; Hendricks, Merl J.; and Babcock, Robert L., 4,222,750, Cl. 55-58.000.

Babcock & Wilcox Company, The: *See*—
Bohl, Thomas L., 4,222,900, Cl. 252-474.000.
Krechmery, Roger L., 4,222,815, Cl. 156-630.000.

Bacher, Helmut; and Schulz, Helmuth, to Krauss-Maffei Austria Gesellschaft m.b.H. Apparatus for processing synthetic thermoplastic material. 4,222,728, Cl. 425-305.100.

Backhouse, Richard J., to National Research Development Corporation. Electronic heart implant. 4,222,385, Cl. 128-419.0PG.

Backx, Leo J. J.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,223,036, Cl. 424-269.000.

Bacon, Duane E.; Gattermeir, J. David; and Hrivnak, Bonnie J., to Western Electric Company, Inc. Selectively treating an article. 4,222,834, Cl. 204-129.600.

Bader, Leonhard; Giessner, Frank; and Weber, Helmut, to NCR Corporation. Ink jet printer. 4,223,323, Cl. 346-140.00R.

Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Standardized information card. 4,222,516, Cl. 235-492.000.

Baker, Ivan M. Odor extracting apparatus and combination thereof with a toilet. 4,222,129, Cl. 4-213.000.

Baker, Louis J. Card deck and game board. 4,222,572, Cl. 273-306.000.

Bakewell, Henry P., Jr.; and Johnson, Marguerite A., to United States of America, Navy. Turbulent flow device for testing hydrophones. 4,223,397, Cl. 367-13.000.

Baldwin, Derek: *See*—
Gates, Peter S.; and Baldwin, Derek, 4,222,767, Cl. 71-103.000.

Balle, Gerhard: *See*—
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,223,114, Cl. 525-440.000.

Ballif, John L., III; and Yuan, Wei W., to United States of America, Energy. Alkali metal protective garment and composite material. 4,223,064, Cl. 428-246.000.

Ballman, Gray C. Means for controlling battery chargers. 4,223,262, Cl. 320-40.000.

Bals, Edward J., to Pennbrook Corporation. Turbine driven rotary atomizer and method of use. 4,222,523, Cl. 239-216.000.

Banas, Conrad M.: *See*—
Peters, George T.; and Banas, Conrad M., 4,223,202, Cl. 219-121.00L.

Bando, Yoshihide: *See*—
Agatahama, Shunichi; Masaki, Akio; and Bando, Yoshihide, 4,223,290, Cl. 335-229.000.

Baney, Ronald H.; and Harris, Len A., to Dow Corning Corporation. Flexible coating resins from siloxane resins having a very low degree of organic substitution. 4,223,072, Cl. 428-412.000.

Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., to Northern Telecom Limited. LCDs (Liquid crystal displays) controlled by thin film diode switches. 4,223,308, Cl. 340-719.000.

Barda, Henry J., to Ferro Corporation. Process for polybrominating bisphenoxyalkanes. 4,223,169, Cl. 568-645.000.

Barigot, Jean-Claude; and Beau, Jean-Jacques, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Device for inserting several bits in a rhythmed digital train. 4,223,269, Cl. 328-63.000.

Barnes, George H., to Burroughs Corporation. Parallel access alignment network with barrel switch implementation for d-ordered vector elements. 4,223,391, Cl. 364-900.000.

Baron, Kenneth: *See*—
Hegedus, Louis; Oh, Se H.; and Baron, Kenneth, 4,222,236, Cl. 60-274.000.

Barowitz, Peter J.; and Baxendale, Roy, to Elliott Brothers (London) Limited. Vibration responsive intruder alarm systems. 4,223,304, Cl. 340-566.000.

Barthel, Horst K. F., to Oil Base Germany G.m.b.H. Apparatus for removing hydrocarbons from drill cuttings. 4,222,988, Cl. 422-309.000.

Barton, Derek H. R.: *See*—
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BASF Aktiengesellschaft: *See*—
Fink, Fritz, 4,223,045, Cl. 426-335.000.
Kast, Hellmut; Grychtol, Klaus; and Feichtmayr, Franz, 4,223,144, Cl. 544-392.000.

BASF Farben & Fasern AG: *See*—
Liedek, Egon; Dimroth, Peter; Ruff, Wolfgang; Berger, Gerhard; and Reiter, Peter, 4,222,788, Cl. 106-289.000.

Bass, David S., to Sperry Corporation. Digital tester. 4,222,514, Cl. 371-27.000.

Bassett, Leslie, to Upton Industries, Inc. Electric salt bath furnace. 4,222,554, Cl. 266-120.000.

Bastian, Jean-Michel, to Sandoz Ltd. Treating prostate hypertrophy with 4-(4H-benzo[4,5]cyclohepta[1,2-b]thiophen-4-ylidene)-1-methylpiperidines. 4,223,035, Cl. 424-267.000.

Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., to Vickers Limited. Hardness testing apparatus. 4,222,262, Cl. 73-81.000.

Battelle Development Corporation: *See*—
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Bauer, Horace P.: *See*—
McQueston, James C.; and Bauer, Horace P., 4,222,335, Cl. 105-397.000.

Baumann, Rolf: *See*—
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 201-2.500.

Baur, Guenter; Greubel, Waldemar; Knauer, Rudolf; and Krueger, Hans, to Siemens Aktiengesellschaft. Arrangement for optical transmission of communications. 4,222,880, Cl. 455-617.000.

Bavoux, Robert: *See*—
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Baxendale, Roy: *See*—
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Baxter Travenol Laboratories, Inc.: *See*—
Ruschke, Ricky R.; and Schwades, Bette R., 4,222,407, Cl. 137-512.150.
Smith, Dale A., 4,222,379, Cl. 128-214.00D.

Bayer Aktiengesellschaft: *See*—
Bier, Peter; Binsack, Rudolf; and Rempel, Dieter, 4,223,106, Cl. 525-173.000.
Bier, Peter; and Binsack, Rudolf, 4,223,113, Cl. 525-439.000.
Bier, Peter; and Binsack, Rudolf, 4,223,125, Cl. 528-305.000.
Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., 4,223,095, Cl. 521-55.000.
Hederich, Volker; Kruckenberg, Winfried; and Schundehutte, Karl H., 4,222,947, Cl. 260-380.000.
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Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, 4,223,147, Cl. 546-224.000.
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von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

BBC Brown, Boveri & Company, Limited: *See*—
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Muller, Elmar; and Weimann, Klaus, 4,223,331, Cl. 357-38.000.
Simmen, Eugene, 4,223,265, Cl. 324-127.000.
Sittig, Roland, 4,223,332, Cl. 357-38.000.

Beasley, Robin D., to Elliott Brothers (London) Limited. Fibre optic cable termination testing. 4,222,664, Cl. 356-73.100.

Beaton, John M.: *See*—
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Beatty, Charles L.; and Pollet, Jean-Claude, to Xerox Corporation. Process for preparing toner of improved mechanical properties. 4,222,982, Cl. 264-143.000.

Beau, Jean-Jacques: *See*—
Barigot, Jean-Claude; and Beau, Jean-Jacques, 4,223,269, Cl. 328-63.000.
Beaver, Richard C., to American Electronics, Inc. Film advance control mechanism. 4,222,648, Cl. 354-171.000.
Beccaris, Carlo, to Societe Anonyme Francaise du Ferodo. Band brake for a rotating member, and a clutch having such a brake. 4,222,470, Cl. 192-17.00A.
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., to Air Products and Chemicals, Inc. Amine salts of tertiary amino acids. 4,223,139, Cl. 544-171.000.
Becher, Wolfram: *See*—
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased, 4,222,257, Cl. 72-201.000.
Bechtel, Jon H., to Robertshaw Controls Company. Pulse transformer. 4,223,195, Cl. 219-10.55B.
Beck, Ronald A. Fishing rod case. 4,222,193, Cl. 43-26.000.
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Momany, Frank A., 4,223,020, Cl. 424-177.000.
Momany, Frank A., 4,223,021, Cl. 424-177.000.
Becton Dickinson & Company: *See*—
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O'Hanlon, Peter J.; Woodford, Maurice C.; and Rogers, Norman H., 4,222,942, Cl. 260-345.80R.
Roy, Peter; Overell, Brian G.; and Stanworth, Denis R., 4,223,016, Cl. 424-177.000.
Smale, Terence C., 4,223,038, Cl. 424-274.000.
Taskis, Charles B., 4,223,006, Cl. 424-16.000.
Beecher, Brazier K., to Voss Steel Corporation. Method of recovering hydrochloric acid from spent hydrochloric acid pickle waste. 4,222,997, Cl. 423-481.000.
Beer, Larry D.; and Slicker, James M., to Valeron Corporation, The. Stepper motor drive apparatus. 4,223,260, Cl. 318-696.000.
Beirnes, James R. Combination window casing and storm window frame. 4,222,200, Cl. 49-63.000.
Beiser, Leo. Visual effects optical relay. 4,222,653, Cl. 354-270.000.
Beishline, Allen W.: *See*—
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Belisomi, Pietro, to Indesit Industria Elettrodomestici Italiana S.p.A. Control circuit. 4,223,352, Cl. 358-185.000.
Bell, Gunter; and Watermann, Willy, to Kloeckner Werke. Mine roof support. 4,222,686, Cl. 405-295.000.
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Bell Telephone Laboratories, Incorporated: *See*—
Auborn, James J., 4,223,080, Cl. 429-194.000.
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Okinaka, Yutaka; and Smith, Lawrence E., 4,222,996, Cl. 423-371.000.
Belle, Jimmie. Bath composition. 4,223,018, Cl. 424-177.000.
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Bellino, Ralph R.; Bellino, Michael J.; and Thompson, Robert, to W. R. Grace & Co. Selector pin assembly for manual transmission shifter. 4,222,284, Cl. 74-473.00R.
Belmares-Sarabia, Armand; and Chayka, Stanley J. Arrangements for modifying signals indicative of anamorphic images. 4,223,343, Cl. 358-54.000.
Beloit Corporation: *See*—
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,222,817, Cl. 162-4.000.
Belsky, Milan; Schwind, Albert; Winkhaus, Gunter; and Schierholt, Joseph. Method for the manufacture of pure aluminum oxide from aluminum ore. 4,222,989, Cl. 423-126.000.
Bemis Company, Inc.: *See*—
Cooper, Barry A., 4,222,913, Cl. 260-23.0AR.
Benasutti, John E.: *See*—
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Bendell, Sidney L., to RCA Corporation. Focusing system for color TV camera. 4,223,253, Cl. 315-382.000.
Bendix Corporation, The: *See*—
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Hansen, Charles M., Jr.; and Wohlberg, Alfred W., 4,223,263, Cl. 322-47.000.
Kluger, Michael A.; and DuCharme, Robert T., 4,222,467, Cl. 188-79.5GE.
Payne, Delmar V., 4,223,309, Cl. 343-5.00W.
Taig, Alistair G., 4,222,282, Cl. 74-457.000.
Benedict, Melvin A. Machine for marking baked goods. 4,223,204, Cl. 219-243.000.
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Bengali, Ajay M.; Zuendt, Richard F.; Allan, John L. H.; and Readio, Philip D., to Dart Industries Inc. Non-chromate conversion coatings. 4,222,779, Cl. 106-14.120.
Bengtsson, Alf R. A.; Carlborg, John L.; and Ewertsson, Bengt R. E. Folding machine for shirts and similar garments. 4,222,507, Cl. 223-37.000.
Benner, Robert L. Holder for an abrasive plate. 4,222,204, Cl. 51-362.000.
Beppu, Norio: *See*—
Niwa, Masatake; Inoue, Norihiro; Kawamura, Kunio; and Beppu, Norio, 4,222,649, Cl. 354-173.000.
Bergemann GmbH: *See*—
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Liedek, Egon; Dimroth, Peter; Ruff, Wolfgang; Berger, Gerhard; and Reiter, Peter, 4,222,788, Cl. 106-289.000.
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Bergfeld, Manfred: *See*—
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Bergfelt, Nils H.; and Seddon, Richard I., to Optical Coating Laboratory, Inc. Vacuum coating apparatus with rotary motion assembly. 4,222,345, Cl. 118-720.000.
Berghmans, Jacques M. L., to Du Pont de Nemours, E. I., and Company. Substrate with multi-layer nonstick coating. 4,223,069, Cl. 428-324.000.
Bergwerksverband GmbH: *See*—
Flockenhaus, Claus; and Hartkopf, Edgar, 4,222,824, Cl. 201-41.000.
Berliner, Emanuel; Spiegel, Elwyn; and Kaneda, Nobuo, to Bristoline, Inc. Sphygmomanometer gauge and method of use for blood pressure measurement. 4,222,390, Cl. 128-677.000.
Bernardi, Luigi: *See*—
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; and Scarponi, Ugo, 4,223,146, Cl. 546-118.000.
Bernicky, Joseph. Alignment sight for hand drills. 4,222,175, Cl. 33-263.000.
Bernier, Raymond. Anti-theft and alarm device for a vehicle. 4,223,298, Cl. 340-64.000.
Berrebi, Meyer. Logical deduction development game. 4,222,565, Cl. 273-153.00R.
Berry, David, to BP Chemicals Limited. Use of acid salts in dyeing and/or printing processes. 4,222,742, Cl. 8-455.000.
Berry, Troy R. Golf putter. 4,222,566, Cl. 273-164.000.
Bexten, Ludger; Cornils, Boy; Hahn, Hans-Dieter; and Tummes, Hans, to Ruhrchemie Aktiengesellschaft. Process for the manufacture of aldehydes. 4,222,966, Cl. 568-451.000.
Bhagat, Jayant K.; and Steele, Martin C., to General Motors Corporation. Method for controlling plasma etching rates. 4,222,838, Cl. 204-192.00E.
Biax Fiberfilm Corporation: *See*—
Schwarz, Eckhard C. A., 4,223,059, Cl. 428-198.000.
Bibbee, Jeffrey N.; and Smith, Thomas W., to McNeil Akron, Inc. Apparatus for rapid data verification of a programmable timer. 4,223,213, Cl. 235-92.00T.
BICC Limited: *See*—
Crew, Eric W.; Harvey, Peter; and Fry, Andrew R., 4,223,175, Cl. 174-15.00R.
Bier, Peter; Binsack, Rudolf; and Rempel, Dieter, to Bayer Aktiengesellschaft. Block copolyesters which crystallize rapidly. 4,223,106, Cl. 525-173.000.
Bier, Peter; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Polyester compositions which crystallize rapidly. 4,223,113, Cl. 525-439.000.
Bier, Peter; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Polyester compositions which crystallize rapidly. 4,223,125, Cl. 528-305.000.
Billeruds Aktiebolag: *See*—
Johansson, Gunnar; and Kullander, Mats O., 4,222,342, Cl. 118-50.000.
Bindel, Paul H. Tire traction chain. 4,222,425, Cl. 152-234.000.
Bingham, Joseph P.; and Lagoni, William A., to RCA Corporation. Image detail improvement in a vertical detail enhancement system. 4,223,340, Cl. 358-31.000.
Binsack, Rudolf: *See*—
Bier, Peter; Binsack, Rudolf; and Rempel, Dieter, 4,223,106, Cl. 525-173.000.
Bier, Peter; and Binsack, Rudolf, 4,223,113, Cl. 525-439.000.
Bier, Peter; and Binsack, Rudolf, 4,223,125, Cl. 528-305.000.
Biomedical Engineering Associates, Inc.: *See*—
Birtwell, William, 4,222,384, Cl. 128-349.00B.
Biondetti, Mario, to Escher Wyss Aktiengesellschaft. Apparatus for determining the pressure forces effective in a rolling mill having at least one controlled deflection roll and at least one counter roll. 4,222,324, Cl. 100-47.000.
Biondina, Joseph: *See*—
Zellweger, Conrad; and Biondina, Joseph, 4,222,148, Cl. 16-128.00A.

Bippus, Jacob R., to Rockwell International Corporation. Fastener tool socket retaining assembly. 4,222,294, Cl. 81-177.00R.

Birkeland, Stephen P.: *See*—
Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., 4,222,902, Cl. 252-500.000.

Birtwell, William, to Biomedical Engineering Associates, Inc. Catheter. 4,222,384, Cl. 128-349.00B.

Bishop, Keith C., III: *See*—
Vorhis, Frederick H., Jr.; and Bishop, Keith C., III, 4,222,854, Cl. 208-80.000.

Blalock, Sammy E. Method for acoustic signal detection. 4,223,398, Cl. 367-34.000.

Blohm & Voss AG: *See*—
Mange, Johannes, 4,222,288, Cl. 74-665.00B.

Blue Cross Laboratories: *See*—
Mahler, Darrell G.; and Doumani, Charles, 4,223,029, Cl. 427-242.000.

Blyth, Robert C.: *See*—
Clark, Dennis E.; and Blyth, Robert C., 4,222,939, Cl. 260-239.100.

Bobo, Melvin; and DuBell, Thomas L., to General Electric Company. Combustor dome assembly. 4,222,230, Cl. 60-39.360.

Bock, Jan: *See*—
Makowski, Henry S.; Klein, Robert R.; Lundberg, Robert D.; and Bock, Jan, 4,222,914, Cl. 260-23.70B.

Bodenhamer, Donald J. Camera adapter bracket. 4,222,654, Cl. 354-293.000.

Boehm, Horst; and Hellberg, Karl-Heinz, to Kali-Chemie AG. Process for preparing bromine- and fluorine-containing halogenated hydrocarbons. 4,222,967, Cl. 260-653.800.

Boehringer Mannheim GmbH: *See*—
Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, 4,223,089, Cl. 435-12.000.

Boeing Company, The: *See*—
Brogan, Joseph, 4,223,053, Cl. 428-35.000.

Boelter, Stuart R., to Arctic Enterprises, Inc. Trailer assembly for snowmobiles. 4,222,698, Cl. 414-477.000.

Bogardus, E. Hal; Hildenbrand, Walter W.; and Levanoni, Menachem, to International Business Machines Corporation. Method and apparatus for compensating for instability of a stream of droplets. 4,223,318, Cl. 346-1.100.

Bogatzki, Hans-Ulrich. Solar collector assembly. 4,222,372, Cl. 126-443.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Phenylforamidines and pesticidal methods using same. 4,223,027, Cl. 424-211.000.

Bohl, Thomas L., to Babcock & Wilcox Company, The. Method of activating a palladium-silver alloy. 4,222,900, Cl. 252-474.000.

Bohrn, Walter J.; and Moggio, William A., to Armstrong Cork Company. Coloration method for textiles. 4,222,740, Cl. 8-448.000.

Boiten, Ebbe; Tietjens, Eduard W.; de Vries, Jochem J.; and de Vries, Tjamme, to U.S. Philips Corporation. Shaving apparatus. 4,222,168, Cl. 30-43.600.

Bokelmann, Horst, to Metzeler Schaum GmbH. Device for synchronizing the movement of the cover web and base web during the continuous production of rectangular foam blocks. 4,222,722, Cl. 425-89.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis J. G., 4,222,441, Cl. 172-59.000.

Bomball, William A.: *See*—
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., 4,223,129, Cl. 536-4.000.

Bongard, James A.; Duncan, Eugene F.; and Jaeschke, James R., to Eaton Corporation. Fiber optic electric switch. 4,223,217, Cl. 250-227.000.

Bonner, Edgar L.; and Faerber, Nelson A., to Faerber, Nelson A. Emergency control system for traffic signals. 4,223,295, Cl. 340-32.000.

Bononi, Walter H. Safety spectacles. 4,222,640, Cl. 351-83.000.

Boretos, John W.; and Iriguchi, Norio, to United States of America, Health, Education & Welfare. Unitized three leaflet heart valve. 4,222,126, Cl. 3-1.500.

Borg-Warner Corporation: *See*—
Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, 4,222,898, Cl. 252-447.000.

Born, Eberhard; and Paul, Gerald. Method of and apparatus for producing texture topograms. 4,223,219, Cl. 250-272.000.

Borowiec, Richard A.: *See*—
Schreyer, Kenneth D.; and Borowiec, Richard A., 4,222,293, Cl. 81-90.00B.

Boston, David R., to Minnesota Mining and Manufacturing Company. Method of making plate oleophilic. 4,223,087, Cl. 430-302.000.

Boston Gas Products, Inc.: *See*—
Pompei, Francesco; and Gerstmann, Joseph, 4,222,350, Cl. 122-32.000.

Bott, John A. Vehicle article carrier. 4,222,508, Cl. 224-324.000.

Bottenbruch, Ludwig: *See*—
von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

Boulter, David G.: *See*—
Chapman, Christopher P.; and Boulter, David G., 4,222,556, Cl. 271-3.100.

Boutin, Francois-Regis; Deleuze, Michel; Marchive, Daniel; and Reze, Rene, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Aluminum alloy. 4,222,774, Cl. 75-148.000.

Bouwhuis, Gijsbertus; and Kramer, Pieter, to U.S. Philips Corporation. Videodisc with undulating nested tracks. 4,223,347, Cl. 358-128.500.

Bouy, Pierre; and Ravier, Dominique, to Rhone-Poulenc Industries. Electrode for electrolysis. 4,222,842, Cl. 204-290.00F.

Bowers, Earl Q.; and Nelson, David L., to International Business Machines Corporation. System and method for attaching magnetic storage devices having dissimilar track capacities and recording formats. 4,223,390, Cl. 364-900.000.

Boyer, Nicodemus E.; Cammack, Travers K., II; and Nyberg, David D., to Raychem Corporation. High voltage insulating compositions containing phosphorus compounds. 4,223,071, Cl. 428-411.000.

Boyle, Robert J., to Arco Polymers, Inc. Fire retardant treatment of fire unstable materials and products obtained. 4,223,066, Cl. 428-306.000.

Boyne Mountain Lodge, Inc.: *See*—
Kircher, Everett F.; and Dilworth, James L., 4,222,519, Cl. 239-14.000.

BP Chemicals Limited: *See*—
Berry, David, 4,222,742, Cl. 8-455.000.

Brackmann, Warren A.; and Kuhner, Albert, to Rothmans of Pall Mall Canada Limited. Opening and moistening tobacco from bales. 4,222,397, Cl. 131-138.00R.

Brader, Walter H., Jr.: *See*—
Watts, Lewis W., Jr.; Brader, Walter H., Jr.; Moss, Philip H.; and Yeakey, Ernest L., 4,222,957, Cl. 260-512.00R.

Bradford, Robert S., Jr.; Braverman, Leonard W.; and Levatter, Jeffrey I., to Mathematical Sciences Northwest, Inc. Pulsed electric discharge laser utilizing water dielectric blumlein transmission line. 4,223,279, Cl. 331-94.5PE.

Braeger, Horst, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Apparatus for the skinning of fish fillets. 4,222,152, Cl. 17-62.000.

Braithwaite, David, to Emhart Industries, Inc. Glassware forming machines. 4,222,761, Cl. 65-207.000.

Braithwaite, David, to Emhart Industries, Inc. Glassware forming machines. 4,222,762, Cl. 65-226.000.

Braverman, Leonard W.: *See*—
Bradford, Robert S., Jr.; Braverman, Leonard W.; and Levatter, Jeffrey I., 4,223,279, Cl. 331-94.5PE.

Brec, Raymond: *See*—
Armand, Michel; Brec, Raymond; and Le Mehaute, Alain, 4,223,078, Cl. 429-194.000.

Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, to Daimler-Benz Aktiengesellschaft. Motor vehicle body, especially for passenger motor vehicles. 4,222,603, Cl. 296-146.000.

Brennan, Louis G., to Alier-Screen, Inc. Allergy testing device with vented base. 4,222,392, Cl. 128-743.000.

Bretschneider, Edward S.: *See*—
Rubino, Andrew M.; Jones, John L.; and Bretschneider, Edward S., 4,223,010, Cl. 424-66.000.

Brewer, Thomas D., to Caterpillar Tractor Co. Endplay control gusset. 4,222,616, Cl. 305-54.000.

Bridgestone Tire Company Limited: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.
Tsuzura, Junichi; and Kojima, Yukio, 4,222,424, Cl. 152-209.00B.

Briggs, George J.; and Wei, Yung-Kang, to Polysar Limited. Processing green strength polymers. 4,222,906, Cl. 260-5.000.

Brigham, Roger S.: *See*—
Erlandson, Paul M.; Ullery, Lee R.; and Brigham, Roger S., 4,223,196, Cl. 219-61.200.

Brimaud, Gilbert J., to Societe Anonyme Francaise du Ferodo. Brake having an annular cylindrical braking member and a pivotally and slidably mounted caliper member. 4,222,466, Cl. 188-76.000.

Brinkmann, Franz J.: *See*—
Schaloske, Peter; Kuffel, Wolfgang; and Brinkmann, Franz J., 4,222,683, Cl. 405-204.000.

Bristol-Myers Company: *See*—
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,223,135, Cl. 544-30.000.

Bristoline, Inc.: *See*—
Berliner, Emanuel; Spiegel, Elwyn; and Kaneda, Nobuo, 4,222,390, Cl. 128-677.000.

British Broadcasting Corporation: *See*—
Drewery, John O., 4,223,341, Cl. 358-36.000.

Brixius, Darryl W.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Coating compositions comprising isocyanate-functional polymers containing a terminal thioalkyl group. 4,222,909, Cl. 260-18.0TN.

Brock, James D., to Astec Industries, Inc. Control system for aggregate delivery system. 4,222,498, Cl. 222-58.000.

Broess, Arnoldus I. A.: *See*—
Zeelen, Filippus J.; and Broess, Arnoldus I. A., 4,222,940, Cl. 260-239.55R.

Brogan, Joseph, to Boeing Company, The. Truss core panels. 4,223,053, Cl. 428-35.000.

Brosene, William G., Jr., to Magnum Automotive Equipment, Inc. Bead breaker mechanism for a tire changer machine. 4,222,426, Cl. 157-1.280.

Broster, David L., to English Electric Company Limited, The. Input circuits. 4,223,299, Cl. 340-166.00R.

Broughton, Roy M.; Thomas, Joseph R.; and Winters, Terence E., to Goodyear Tire & Rubber Company, The. Method for producing polyesters containing low amounts of ether by-products. 4,223,124, Cl. 528-272.000.

Brown, August R., to Koshear, Inc. Feminine brassiere cup fur lining. 4,222,388, Cl. 128-479.000.

Brown, Marshall B. Aquatic weed harvesting apparatus. 4,222,217, Cl. 56-9.000.

Brown, Raynard C.; and Lopshire, Norval L. Truck body. 4,222,606, Cl. 296-183.000.

Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., to Savin Corporation. Low profile keyboard operator. 4,222,675, Cl. 400-474.000.

Browning, Charles E. Variable position friction joint. 4,222,680, Cl. 403-56.000.

Bruhn, Mildred S.; and Pappo, Raphael, to G. D. Searle & Co. 2,3,5-Trisubstituted cyclopentanealkenoic acids, derivatives thereof and intermediates thereto. 4,223,158, Cl. 560-121.000.

Brulet, Daniel; Pocheville, Robert; and Chauvel, Bernard, to Rhone-Poulenc Industries; and l'Institut Francais du Petrole. Polymers bearing groups derived from N-substituted lactams and their use as lubricating oil additives. 4,222,882, Cl. 252-51.50A.

Bruns, Klaus: *See—*
Meins, Peter; and Bruns, Klaus, 4,222,904, Cl. 252-522.00R.

Brunsell, Dennis A.: *See—*
Riggs, Olen L., Jr.; and Brunsell, Dennis A., 4,222,826, Cl. 204-1.500.

Bryant, Earle R.; Knittel, Gerald H.; and Dircks, Lon E., to Inmont Corporation. Vulcanizable silicon terminated polyurethane polymer compositions having improved cure speed. 4,222,925, Cl. 260-37.00N.

Bryson, Neil B., to Alcan Research and Development Limited. Continuous casting with resilient strip-edge gripping means. 4,222,431, Cl. 164-89.000.

Buchner, John. Trim units for valances, doors and the like. 4,222,427, Cl. 160-19.000.

Buckle, Derek R.; and Smith, Harry, to Beecham Group Limited. Triazolo [4,5-b] quinolines and prophylaxis of allergic diseases with them. 4,223,032, Cl. 424-258.000.

Buckle, Thomas G.; and Bellingham, Andrew I., to Warman International Limited. Production of bismuth trichloride. 4,222,998, Cl. 423-491.000.

Budd Company, The: *See—*
McQueston, James C.; and Bauer, Horace P., 4,222,335, Cl. 105-397.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,222,409, Cl. 137-596.130.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,222,958, Cl. 260-559.00D.

Bugnone, Aldo. Device for controlling rotary motion. 4,222,512, Cl. 226-181.000.

Buinicky, Ernest P.: *See—*
Estes, John H.; and Buinicky, Ernest P., 4,222,439, Cl. 166-272.000.

Bulat, Bulent, to Chloride Incorporated. Battery charging circuit for an emergency system. 4,223,232, Cl. 307-66.000.

Bulgrin, Robert W.: *See—*
Moffitt, Jerry T.; and Bulgrin, Robert W., 4,223,294, Cl. 338-122.000.

Bunger, Richard E., to Corral Industries, Incorporated. Animal shelter for large-scale feedlot operations. 4,222,347, Cl. 119-16.000.

Bunnell, Charles A., to Eli Lilly and Company. Cephalosporin reduction process. 4,223,133, Cl. 544-16.000.

Burkes, Daniel O.: *See—*
Valeri, William J.; and Burkes, Daniel O., 4,222,865, Cl. 209-399.000.

Burn, Ian, to Sprague Electric Company. Monolithic capacitor with low firing zirconate and nickel electrodes. 4,223,369, Cl. 361-321.000.

Burnett, L. Nelson, Jr., to Reading Door Closer Corp. Door closer with assist or door operating features. 4,222,147, Cl. 16-62.000.

Burro-Badger Corporation: *See—*
Wuerflein, James G.; and Spence, Charles R., 4,222,492, Cl. 212-270.000.

Burroughs Corporation: *See—*
Barnes, George H., 4,223,391, Cl. 364-900.000.

Burroughs Wellcome Co.: *See—*
Lazarus, Norman R., 4,223,017, Cl. 424-177.000.

Burton, John H., to American Medical Systems, Inc. Pressure regulated artificial sphincter systems. 4,222,377, Cl. 128-1.00R.

Burzynski, Alfred J., to Owens-Illinois, Inc. Organopolysiloxane resins of increased hardness. 4,223,121, Cl. 528-12.000.

Butler Manufacturing Company: *See—*
Alderman, Robert J., 4,222,212, Cl. 52-749.000.

Butte, Walter A., Jr.; Murtaugh, William J.; and Angstadt, Howard P., to Suntech, Inc. Process for hydrogenating aromatic dinitriles. 4,222,961, Cl. 260-563.00D.

Byham, Don E.; Sheppard, Edward W.; and Chen, Catherine S. H., to Mobil Oil Corporation. Oil recovery process involving the injection of thickened water. 4,222,881, Cl. 252-8.55D.

C. H. Dexter Limited: *See—*
Jones, Newlyn; Stewart, Alistair C.; and Elston, Colin, 4,222,821, Cl. 162-164.00R.

C. van der Lely N. V.: *See—*
van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis J. G., 4,222,441, Cl. 172-59.000.

Cada, Frantisek: *See—*
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

Caldwell, Donald B.; and Gardeski, Thomas F., to Minnesota Mining and Manufacturing Company. High-temperature damping composite. 4,223,073, Cl. 428-422.000.

Caldwell, Michael C. Method and means for carbonating liquids in situ. 4,222,972, Cl. 261-121.00R.

Caldwell, Paul E.: *See—*
McLean, Michael E.; Ensley, Rufus N.; Alcaraz, Anthony J.; and Caldwell, Paul E., 4,222,809, Cl. 156-267.000.

Calgon Corporation: *See—*
Sinkovitz, Gloria D., 4,222,901, Cl. 252-500.000.

Calhoun, Clifford A.: *See—*
Zang, Eugene E.; Sheck, Joe S.; and Calhoun, Clifford A., 4,222,693, Cl. 409-175.000.

Calhoun, Gregory L.: *See—*
King, William E.; and Calhoun, Gregory L., 4,222,540, Cl. 248-205.00R.

Calle, Daniel G.; and de Gaufridy de Dortan, Jacques M. G., to Compagnie Generale d'Entertien et de Reparation Coger. Coupling means for an installation for refrigerating containers. 4,222,589, Cl. 285-9.00R.

Calvino, Ben J., to Westinghouse Electric Corp. Upstanding mounting structure for high-voltage three-break live-module circuit-breaker. 4,223,191, Cl. 200-145.000.

Cam Gears Limited: *See—*
Adams, Frederick J., 4,223,254, Cl. 318-2.000.

Cammack, Travers K., II: *See—*
Boyer, Nicodemus E.; Cammack, Travers K., II; and Nyberg, David D., 4,223,071, Cl. 428-411.000.

Canadian Fishing Co. Ltd., The: *See—*
McKee, James A., 4,222,151, Cl. 17-52.000.

Canadian Patents & Development Ltd.: *See—*
Walser, Donald C.; and McLauchlan, Thomas A., 4,222,421, Cl. 144-325.000.

Canon Kabushiki Kaisha: *See—*
Furuichi, Katsushi; Honma, Toshio; and Murakàmi, Katsumi, 4,222,660, Cl. 355-14.00R.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,222,659, Cl. 355-14.00R.
Matsufuji, Yohji, 4,222,887, Cl. 252-299.000.
Tsukada, Syusei; Ando, Yujiro; and Tanaka, Hiroshi, 4,222,776, Cl. 430-55.000.

Cappon, Arthur M.; and Sage, Jay P., to Raytheon Company. Charge transfer device input circuitry. 4,223,233, Cl. 307-221.00D.

Capra, Nicholas G.; and Hammett, Roy, to James D. Pauls, Limited. Non-propellant, duration spray dispenser with positive shut off valve. 4,222,500, Cl. 222-207.000.

Capra, Nicholas G.: *See—*
Hammett, Roy; and Capra, Nicholas G., 4,222,501, Cl. 222-207.000.

Carimi, Darryl L.: *See—*
Lee, Harold D.; and Carimi, Darryl L., 4,222,499, Cl. 222-183.000.

Carl Zeiss Stiftung: *See—*
Muchel, Franz, 4,222,634, Cl. 350-189.000.

Carlborg, John L.: *See—*
Bengtsson, Alf R. A.; Carlborg, John L.; and Ewertsson, Bengt R. E., 4,222,507, Cl. 223-37.000.

Carle, Don W., to Carle Instruments, Inc. High pressure valve for chromatography. 4,222,412, Cl. 137-625.470.

Carle Instruments, Inc.: *See—*
Carle, Don W., 4,222,412, Cl. 137-625.470.

Carlson, Gordon A., to PPG Industries, Inc. Sniff gas recovery method. 4,222,833, Cl. 204-128.000.

Carlstrom, William L.; Reineck, Ronald W.; and Svoboda, Glenn R., to Freeman Chemical Corporation. Rigid polyurethane foam containing polyester residue digestion product and building panel made therefrom. 4,223,068, Cl. 428-310.000.

Carr, Norman L.; and Schmid, Bruce K., to Gulf Oil Corporation. Coal liquefaction process with improved slurry recycle system. 4,222,847, Cl. 208-8.0LE.

Carr, Norman L.; and Schmid, Bruce K., to Gulf Oil Corporation. Coal liquefaction process employing extraneous minerals. 4,222,848, Cl. 208-8.0LE.

Carroll, John M. Lauric acid for the prevention and treatment of mycobacterial diseases. 4,223,040, Cl. 424-318.000.

Carstensen, Kenneth J.: *See—*
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,222,174, Cl. 33-199.00R.

Case, Derek F.: *See—*
Sansom, David J.; and Case, Derek F., 4,223,360, Cl. 360-123.000.

Caspar, Jean-Pierre; and Gaillard, Jacques, to Lafarge. Novel binder and its utilization for preparing quick-setting mortars and microconcretes. 4,222,784, Cl. 106-93.000.

Cassella Aktiengesellschaft: *See—*
Honel, Hans; Keller, Karlfried; Michel, Walter; and Schon, Manfred, 4,223,141, Cl. 544-196.000.

Castellano, Thomas P. Turbocharged engine. 4,222,240, Cl. 60-611.000.

Castells, Onofre T. M.: *See—*
Johnson, James E.; Castells, Onofre T. M.; and Rundell, Dan J., 4,222,233, Cl. 60-225.000.

Castelluzzo, James M.; and Rackman, Michael I., to TM Invention Associates. Multi-layer graphic arts tape system. 4,223,055, Cl. 428-40.000.

Castleberry, Billy J., to AAA Office Coffee Service, Inc. Coffee maker. 4,222,320, Cl. 99-281.000.

Caswell, Bruce F., to Arcanum Corporation. Process for preparing agglomerates of clays. 4,222,981, Cl. 264-117.000.

Caterpillar Tractor Co.: *See—*
Brewer, Thomas D., 4,222,616, Cl. 305-54.000.
Clouse, Jerry A.; and Dekeyser, Richard A., 4,222,717, Cl. 417-499.000.
DeKeyser, Richard A.; and Miller, Robert H., 4,222,713, Cl. 417-214.000.
Meisel, Thomas C., Jr., 4,222,578, Cl. 280-6.110.
Caudwell, Michael J.: *See—*
Hiskens, Ian R.; Johnson, David C.; and Caudwell, Michael J., 4,222,820, Cl. 162-158.000.
Cavallaro, Antonino: *See—*
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,223,108, Cl. 525-212.000.
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Glossy fibres of the modacrylic type having reduced inflammability, and compositions of matter and process for producing the same. 4,223,108, Cl. 525-212.000.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Boutin, Francois-Regis; Deleuze, Michel; Marchive, Daniel; and Reze, Rene, 4,222,774, Cl. 75-148.000.
Celanese Corporation: *See—*
Halek, George W.; Freed, William T.; Schaul, Jerome S.; Rupp, Raymond W.; and Pauls, Stanley L., 4,223,128, Cl. 528-481.000.
Cella, James A., to General Electric Company. Moisture curable organopolysiloxanes. 4,223,122, Cl. 528-30.000.
Century Packaging Corp.: *See—*
Ullger, Edward J., 4,222,598, Cl. 294-1.00B.
Cervantes, Victoria. Tool for the detailed application of a fluent material. 4,222,677, Cl. 401-129.000.
Ceshkovsky, Ludwig: *See—*
Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,223,349, Cl. 358-128.500.
Chabrol, Jean, to Regie Nationale des Usines Renault. Power transfer circuit. 4,223,313, Cl. 340-870.070.
Chakrabarti, Paritosh M., to GAF Corporation. Hair preparation containing vinyl pyrrolidone copolymer. 4,223,009, Cl. 424-47.000.
Champion Spark Plug Company: *See—*
Gauthier, William D.; Hendricks, Merl J.; and Babcock, Robert L., 4,222,750, Cl. 55-58.000.
Chamran, Morteza M.; and Dimovski, Milan R., to Perkin-Elmer Corporation, The. Photodetector arrangements and circuits. 4,223,215, Cl. 250-211.00R.
Chan, Kwok K., to RCA Corporation. Two into three port phase shifting power divider. 4,223,283, Cl. 333-109.000.
Chapman, Christopher P.; and Boulter, David G., to De La Rue Systems Limited. Sheet feeding apparatus utilizing a spirally slotted stacking wheel. 4,222,556, Cl. 271-3.100.
Chauvel, Bernard: *See—*
Brulet, Daniel; Pocheville, Robert; and Chauvel, Bernard, 4,222,882, Cl. 252-51.50A.
Chayka, Stanley J.: *See—*
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,223,343, Cl. 358-54.000.
Cheeseboro, Robert G. Radial-tracking programmable record player. 4,222,574, Cl. 274-13.00R.
Chemed Corporation: *See—*
Holdt, Donald H.; and Sims, James S., Jr., 4,222,131, Cl. 5-79.000.
Chemie Linz Aktiengesellschaft: *See—*
Wechsberg, Manfred; and Schonbeck, Rupert, 4,222,960, Cl. 260-559.00R.
Chemische Werke Huis Aktiengesellschaft: *See—*
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 201-2.500.
Chen, Catherine S. H.: *See—*
Byham, Don E.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,222,881, Cl. 252-8.55D.
Chen, Ming F., to Cheng Hong Chemical Co., Ltd. Process for preparing 1,1'-dialkyl-4,4'-bipyridylium dihalide. 4,223,150, Cl. 546-258.000.
Chen, Nai Y.: *See—*
Pelrine, Bruce P.; and Chen, Nai Y., 4,222,855, Cl. 208-111.000.
Chen, Robert H. K., to Ortho Pharmaceutical Corp. Total synthesis of the utero-evacuant substance D,L-zoapatanol. 4,222,937, Cl. 260-333.000.
Cheng Hong Chemical Co., Ltd.: *See—*
Chen, Ming F., 4,223,150, Cl. 546-258.000.
Chernack, Milton P.: *See—*
Greenberg, Mishel; Kearney, Michael; and Chernack, Milton P., 4,222,268, Cl. 73-371.000.
Chevali, Harihar D.: *See—*
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,223,373, Cl. 362-13.000.
Chevron Research Company. *See—*
Vorhis, Frederick H., Jr.; and Bishop, Keith C., III, 4,222,854, Cl. 208-80.000.
Chiang, Chwan K.: *See—*
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Shirakawa, Hideki, 4,222,903, Cl. 252-518.000.
Chiba, Yositeru: *See—*
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yositeru; and Kuniya, Jiro, 4,223,197, Cl. 219-61.700.
Chicago Bridge & Iron Company: *See—*
Hoaglin, Harold B.; Grill, James R.; and Keller, Jack H., 4,222,795, Cl. 148-9.600.
Chino, Naoyoshi: *See—*
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.
Chloride Incorporated: *See—*
Bulat, Bulent, 4,223,232, Cl. 307-66.000.
Cholet, Henri, to Institut Francais du Petrole. Drill bit with suction jets. 4,222,447, Cl. 175-340.000.
Chorvat, Robert J., to G. D. Searle & Co. 2,3-Dihydro-3-oxo-5H-pyrido[3,4-b][1,4]-benzothiazine-4-carbonitriles. 4,223,136, Cl. 544-34.000.
Choudhury, Hrishikesh; and Luksch, Heinrich E., to Outboard Marine Corporation. Single lever control with detent mechanism for holding lever vertically. 4,222,474, Cl. 192-0.096.
Chow, Allan T., to Du Pont de Nemours, E. I., and Company. Apparatus for controlling the power supplied to a load. 4,223,207, Cl. 219-494.000.
Chrisman, Willis L.: *See—*
Stauffer, John D.; Arnaudin, Edwin H., Jr.; and Chrisman, Willis L., 4,222,980, Cl. 264-85.000.
Christe, Karl O.: *See—*
Schack, Carl J.; and Christe, Karl O., 4,222,968, Cl. 260-653.000.
Christenson, Philip A.: *See—*
Willis, Brian J.; Christenson, Philip A.; and Barton, Derek H. R., 4,223,167, Cl. 568-820.000.
Christenson, Roger M.; and Erikson, J. Alden, to PPG Industries, Inc. Polyester diol extended uralkyd resin and coating compositions containing the same. 4,222,911, Cl. 260-22.0TN.
Christiansen, Jorgen B., to Isomax, Ingenior- OG Handelsaktieselskab. Furnace lining and method of manufacture. 4,222,337, Cl. 110-336.000.
Christy, Ronald I.; and Anderson, Martin L. Lead chopper. 4,222,296, Cl. 83-459.000.
Chromy, Franz, to Hilti Aktiengesellschaft. Motor-driven hammer drill. 4,222,443, Cl. 173-116.000.
Chudakov, Georgy F.: *See—*
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.
Chun, Victor L.: *See—*
Kubolis, William J.; and Chun, Victor L., 4,222,469, Cl. 192-4.00A.
Chung, Daniel A.; and Lawrence, John P., to Goodyear Tire & Rubber Company, The. 3,5-Diamino-4-tert.-alkylbenzonitriles. 4,222,955, Cl. 260-465.00E.
Church, Richard O.: *See—*
Gage, Paul E.; and Church, Richard O., 4,222,331, Cl. 105-199.00C.
Chyung, Kenneth; and Wusirika, Raja R., to Corning Glass Works. Preparation of oxynitride glass-ceramics. 4,222,760, Cl. 65-32.000.
Ciba-Geigy AG: *See—*
Zimmermann, Anton; and Haenni, Roland, 4,222,343, Cl. 118-325.000.
Ciba-Geigy Corporation: *See—*
Boger, Manfred; and Drabek, Jozef, 4,223,027, Cl. 424-211.000.
Jaeger, Roland; and Huber, Kurt, 4,223,166, Cl. 568-779.000.
Kagi, Bruno; Kormany, Geza; and Luthi, Christian, 4,222,739, Cl. 8-648.000.
Martin, Henry, 4,222,766, Cl. 71-95.000.
Cillis, Daniel J. Ladder tray support attachment. 4,222,541, Cl. 248-210.000.
Cities Service Company: *See—*
Dickerson, Theodore, 4,222,790, Cl. 106-304.000.
Keller, David P., 4,222,987, Cl. 422-150.000.
Citron, Samuel. Material for use in framing pictures and documents. 4,223,058, Cl. 428-189.000.
Clark, Dennis E.; and Blyth, Robert C., to Beecham Group Limited. Process for preparing solid sodium amoxycillin. 4,222,939, Cl. 260-239.100.
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., to Beloit Corporation. Method and apparatus for pulping and grading waste material. 4,222,817, Cl. 162-4.000.
Clarke-Gravely Corporation: *See—*
Lowder, Dale E., 4,222,145, Cl. 15-353.000.
Clayton, William: *See—*
Strong, Barry C.; Marriott, Eric W.; and Clayton, William, 4,222,248, Cl. 66-82.00R.
Clements, Harold J., to Modern Precision Engineers and Associates Limited. Sealing device. 4,222,576, Cl. 277-237.00R.
Clinton, Ernest, to Ethyl Corporation. 4,4'-Furfurylidene bis(2,6-di-tert-butylphenol)antioxidant. 4,222,883, Cl. 252-52.00R.
Clouse, Jerry A.; and Dekeyser, Richard A., to Caterpillar Tractor Co. Fuel injection pump. 4,222,717, Cl. 417-499.000.
Cloyd, James S., to United States of America, Air Force. Indicator for detection of SO_2 leakage. 4,222,745, Cl. 23-230.00L.
Clyde, Robert A. Ceramic sponge heat-exchanger member. 4,222,434, Cl. 165-10.000.
Co-Steel International Limited: *See—*
Field, Michael F., 4,222,258, Cl. 72-239.000.
Cockrell, John R., Jr., to Procter & Gamble Company, The. Laundry detergent compositions having enhanced particulate soil removal performance. 4,222,905, Cl. 252-547.000.
Cole, Jimmy R., to Syntron, Inc. Cable depth control apparatus. 4,222,340, Cl. 114-245.000.
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., to General Electric Company. Photoflash lamp array having reflective coating means. 4,223,373, Cl. 362-13.000.

Colombo, Roberto: *See—*
Ragazzini, Franco; and Colombo, Roberto, 4,222,729, Cl. 425-378.00R.

Colson, Steven D.; Engelking, Paul C.; and Turner, Robert E. High energy, rapid discharge device for the excitation of gas discharge lasers. 4,223,278, Cl. 331-94.5PE.

Colt Industries Operating Corp.: *See—*
Eshelman, Philip V., 4,223,249, Cl. 315-209.00M.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; and Borowiec, Richard A., 4,222,293, Cl. 81-90.00B.

Combet epse Broll, Madeleine: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, 4,223,041, Cl. 424-322.000.

Combustion Engineering, Inc.: *See—*
Ladwig, Richard D., 4,222,984, Cl. 264-261.000.

Combustion Linings Limited: *See—*
Adams, Albert E., 4,222,338, Cl. 110-336.000.

Cominco Ltd.: *See—*
Weir, Donald R.; Vosahlo, Eva A.; and Genik-Sas-Berezowsky, Roman M., 4,222,999, Cl. 423-557.000.

Cominetti, Mario: *See—*
D'Amato, Paolo; and Cominetti, Mario, 4,223,326, Cl. 371-49.000.

Commissariat a l'Energie Atomique: *See—*
Robert, Jacques, 4,222,638, Cl. 350-96.140.

Compagnie Francaise de Raffinage: *See—*
Scherrer, Claude; Durrieu, Marc; and Richmond, John R., 4,222,853, Cl. 208-48.0AA.

Compagnie Generale de Radiologie: *See—*
Laffitte, Andre; and Delair, Jacques, 4,223,225, Cl. 250-445.00T.

Compagnie Generale d'Electricite: *See—*
Armand, Michel; Brec, Raymond; and Le Mehaute, Alain, 4,223,078, Cl. 429-194.000.

Compagnie Generale d'Entertien et de Reparation Coger: *See—*
Calle, Daniel G.; and de Gaufridy de Dortan, Jacques M. G., 4,222,589, Cl. 285-9.00R.

Compagnie Generale des Etablissements Michelin: *See—*
Jamain, Philippe, 4,222,423, Cl. 152-209.00R.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See—*
Barigot, Jean-Claude; and Beau, Jean-Jacques, 4,223,269, Cl. 328-63.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See—*
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,222,516, Cl. 235-492.000.
Lemaire, Francis; Salkazanov, Pierre; and Bavoux, Robert, 4,223,392, Cl. 364-900.000.

Computer Microfilm International Corporation: *See—*
Smith, David L.; and Jamieson, John M., 4,223,212, Cl. 235-92.0MP.

Concast AG: *See—*
Marti, Heinrich; and Fluckiger, Friedrich, 4,222,433, Cl. 164-448.000.

Connelly, George F., Jr. Pumpable pipe cleaning composition. 4,222,886, Cl. 252-149.000.

Connelly, Robert F. Balanced pressure tubular molecular filtration system. 4,222,874, Cl. 210-650.000.

Conoco, Inc.: *See—*
Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., 4,223,164, Cl. 568-618.000.

Consiglio Nazionale Delle Ricerche: *See—*
Righini, Giancarlo; Russo, Vera; and Sottini, Stefano, 4,222,628, Cl. 350-96.110.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Kreis, Gerhard; and August, Peter, 4,222,951, Cl. 556-478.000.

Continental Can Company Inc.: *See—*
Erlandson, Paul M.; Ullery, Lee R.; and Brigham, Roger S., 4,223,196, Cl. 219-61.200.

Cooper, Barry A., to Bemis Company, Inc. Stretch pallet wrap film materials. 4,222,913, Cl. 260-23.0AR.

Cooper Industries, Inc.: *See—*
Rush, Earl E., 4,222,702, Cl. 415-25.000.

Coors Container Company: *See—*
Dugan, Larry M.; and McMillin, Danny L., 4,222,479, Cl. 198-482.000.

Copal Company Limited: *See—*
Ishiguro, Yasuo, 4,222,652, Cl. 354-234.000.

Cornils, Boy: *See—*
Bexten, Ludger; Cornils, Boy; Hahn, Hans-Dieter; and Tummes, Hans, 4,222,966, Cl. 568-451.000.

Corning Glass Works: *See—*
Chyung, Kenneth; and Wusirika, Raja R., 4,222,760, Cl. 65-32.000.
Kerr, Robert J.; and Stastny, Milos, 4,222,836, Cl. 204-180.00G.
Morse, David L.; and Seward, Thomas P., III, 4,222,781, Cl. 106-47.00Q.
Olshansky, Robert, 4,222,631, Cl. 350-96.310.

Corporacion De Fomento De La Produccion: *See—*
Jefferson, Gene; and Laborde, Martin, 4,222,685, Cl. 405-270.000.

Corporation de Fomento de la Produccion: *See—*
Jefferson, Gene; and Laborde, Martin, 4,222,685, Cl. 405-270.000.

Corral Industries, Incorporated: *See—*
Bunger, Richard E., 4,222,347, Cl. 119-16.000.

Cortez, Edwin L.: *See—*
Avila, Maximo L.; and Cortez, Edwin L., 4,222,858, Cl. 209-11.000.

Covington, Robert R.; Temple, Davis L., Jr.; and Yevich, Joseph P., to Mead Johnson & Company. Azolopyrimidinones. 4,223,031, Cl. 424-251.000.

Cox, John M.: *See—*
Sunkle, Thomas H.; and Cox, John M., 4,222,448, Cl. 177-1.000.

Cox, Russell; Drilling, Joseph C.; and Reed, Ronald H., to Square D Company. Pullout fuse holder. 4,222,627, Cl. 339-147.00R.

CPC Engineering Corporation: *See—*
Reid, Robert A., 4,222,704, Cl. 415-72.000.

Craig, Samuel E.: *See—*
Noble, Milton L.; Craig, Samuel E.; and Hoefer, William G., 4,223,354, Cl. 358-233.000.

Crew, Eric W.; Harvey, Peter; and Fry, Andrew R., to BICC Limited. Cable support systems. 4,223,175, Cl. 174-15.00R.

Crim, Paul E.; Richmond, James W.; and Yeomans, Thomas E., to Stryker Corporation. Patient transport apparatus. 4,222,132, Cl. 5-81.00R.

Cripps, David J.; and Kwasiborski, Stanley, Jr., to General Motors Corporation. Vehicle storage space cover arrangement. 4,222,600, Cl. 296-37.100.

Crisp, Stephen; and Wilson, Alan D., to National Research Development Corporation. Cements. 4,222,920, Cl. 260-29.60M.

Crist, Eugene A.: *See—*
Kehl, Donald K., 4,222,199, Cl. 47-59.000.

Crocker, Burton B.: *See—*
Argo, Wesley B.; Crocker, Burton B.; and Sisler, Charles C., 4,222,748, Cl. 55-6.000.

Crothers, William R. Folding cart. 4,222,585, Cl. 280-654.000.

Crowder, Kenneth. Picture rail apparatus. 4,222,544, Cl. 248-495.000.

Crutchfield, Marvin M.; Lannert, Kent P.; and Upton, Charles J., to Monsanto Company. Ether carboxylates containing three carboxylate groups. 4,223,162, Cl. 562-583.000.

Csatary, Laszlo K. Sickbed with hammock. 4,222,133, Cl. 5-90.000.

Cummings, Darold B. Mobile educational toy. 4,222,181, Cl. 35-73.000.

Cuny, Eckehard K. T.; and Lichtenthaler, Frieder W., to Siegfried Aktiengesellschaft. Quinazoline derivatives. 4,223,143, Cl. 544-251.000.

Curtis, Joel E.; and Hall, Thornton D., to Gold Kist, Inc. Method and apparatus for field-drying harvested crops. 4,222,317, Cl. 98-56.000.

Cuscurida, Michael; and Speranza, George P., to Texaco Development Corp. Iodophore compounds. 4,222,954, Cl. 260-463.000.

Daenen, Theo E. G., to U.S. Philips Corporation. Electroplating solution for the electrodeposition of aluminium. 4,222,827, Cl. 204-14.00N.

Daikoku, Takashi: *See—*
Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, 4,222,771, Cl. 75-124.000.

Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, 4,222,603, Cl. 296-146.000.
Gotz, Hans; Hack, Albert; and Winz, Hans, 4,222,314, Cl. 98-2.180.
Helmer, Josef; and Pickard, Jurgen, 4,222,290, Cl. 74-801.000.
Niemeier, Gerd, 4,222,359, Cl. 123-366.000.
Peitsmeier, Karl, 4,222,253, Cl. 70-417.000.

Dainippon Ink & Chemicals, Inc.: *See—*
Mizuno, Shioji; and Enokimoto, Norio, 4,222,926, Cl. 260-40.00R.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Hashimoto, Takeji; Nagao, Yoshio; and Doi, Yasushi, 4,222,247, Cl. 66-75.200.

Dakin, Wayne R.; and Ceshkovsky, Ludwig, to MCA Discovision, Inc. System for rotating an information storage disc at a variable angular velocity to recover information therefrom at a prescribed constant rate. 4,223,349, Cl. 358-128.500.

D'Amato, Paolo; and Cominetti, Mario. Method and device for reducing the probability of loss of a character in a digital transmission employing biphase coding. 4,223,326, Cl. 371-49.000.

D'Amico, John J., to Monsanto Company. Preparation of thiolcarbamates. 4,222,938, Cl. 260-239.00A.

Danielsson, Per-Erik; and Kruse, Carl A. B. Device for examination of distances in a picture. 4,223,387, Cl. 364-515.000.

Dantlgraber, Jorg, to Rexroth GmbH. Radial piston pump. 4,222,714, Cl. 417-273.000.

Dapco Industries, Inc.: *See—*
Sholl, Howard A.; and Marshall, John T., 4,222,275, Cl. 73-636.000.

Dart Industries Inc.: *See—*
Allan, John L. H.; and Patnaik, Birendra K., 4,222,895, Cl. 252-429.00B.
Bengali, Ajay M.; Zuendt, Richard F.; Allan, John L. H.; and Readio, Philip D., 4,222,779, Cl. 106-14.120.

Dassele, Michael A.; Kush, Stephen T.; and Mitchell, Don E., to Sperry Corporation. Fiber optic connector assembly. 4,222,629, Cl. 350-96.200.

Data Recording Instrument Company, Ltd.: *See—*
Sansom, David J.; and Case, Derek F., 4,223,360, Cl. 360-123.000.

Dattilo, Donald P. Electrostatic discharge protection device. 4,223,368, Cl. 361-220.000.

Daubin, Scott C. Pump module for a compliant underwater pipe system. 4,222,701, Cl. 415-7.000.

Dauguet, Jean-Claude; Mazzone, Jean-Pierre; and Moreau, Pierre, to Essilor International, Cie Generale d'Optique. Polishing material for ophthalmic lenses. 4,222,747, Cl. 51-301.000.

Daussan, Andre: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,222,505, Cl. 222-600.000.

Daussan et Compagnie: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,222,505, Cl. 222-600.000.
Daussan, Gerard: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,222,505, Cl. 222-600.000.
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, to Daussan et Compagnie. Actuating device for a casting tube or nozzle. 4,222,505, Cl. 222-600.000.
Davidson, Allen L.; Arnold, Pitt W.; and Stern, Morton, to Motorola, Inc. Multi-transceiver antenna. 4,223,310, Cl. 343-100.0CS.
Davies, Richard G., to Ford Motor Company. High strength dual-phase steel. 4,222,796, Cl. 148-12.00F.
Davis, Michael A. Ceramic solar collector. 4,222,373, Cl. 126-448.000.
Davis, Robert B., to Union Carbide Corporation. Cryopulverizing packed bed control system. 4,222,527, Cl. 241-33.000.
Davison, Samuel H., to General Electric Company. Method and apparatus for reducing eccentricity in a turbomachine. 4,222,708, Cl. 415-127.000.
Dawdy, Terrance H.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,223,115, Cl. 525-455.000.
Dawless, Robert K.; and Jacobs, Stanley C., to Aluminum Company of America. Production of extreme purity aluminum. 4,222,830, Cl. 204-67.000.
Dayco Corporation: *See—*
McLean, Michael E.; Ensley, Rufus N.; Alcaraz, Anthony J.; and Caldwell, Paul E., 4,222,809, Cl. 156-267.000.
Daymond Limited: *See—*
Skinner, Harcourt J., 4,222,594, Cl. 285-280.000.
De La Rue Systems Limited: *See—*
Chapman, Christopher P.; and Boulter, David G., 4,222,556, Cl. 271-3.100.
de Boer, Eeltje, to U.S. Philips Corporation. Method of reducing interference components in a frequency modulated signal and device for carrying out said method. 4,223,282, Cl. 332-10.000.
de Bosredon, Pierre. Mobile winch. 4,222,550, Cl. 254-223.000.
Deere & Company: *See—*
Sikula, William J., Jr., 4,222,875, Cl. 210-235.000.
De Fries, Donald. Combination portable storage container and head rest. 4,222,468, Cl. 190-42.000.
de Gaufridy de Dortan, Jacques M. G.: *See—*
Calle, Daniel G.; and de Gaufridy de Dortan, Jacques M. G., 4,222,589, Cl. 285-9.00R.
Degen, Hugo, to Marpal AG. Under-mattress for beds or similar articles of furniture. 4,222,134, Cl. 5-191.000.
Degerbeck, Jorgen, to Fagersta AB. Corrosion resistant austenitic stainless steel containing 0.1 to 0.3 percent manganese. 4,222,773, Cl. 75-125.000.
DeGeus, Arie M. Nontracking concentrating solar collector. 4,222,370, Cl. 126-439.000.
Dehne, Clarence A.; and Pachuta, Martin, to Jervis B. Webb Company. Drive unit for a conveyor chain. 4,222,481, Cl. 198-684.000.
DeKeyser, Richard A.; and Miller, Robert H., to Caterpillar Tractor Co. Temperature responsive fuel compensator. 4,222,713, Cl. 417-214.000.
Dekeyser, Richard A.: *See—*
Clouse, Jerry A.; and Dekeyser, Richard A., 4,222,717, Cl. 417-499.000.
Del Norte Technology, Inc.: *See—*
Parker, William H., 4,222,440, Cl. 166-314.000.
Delair, Jacques: *See—*
Laffitte, Andre; and Delair, Jacques, 4,223,225, Cl. 250-445.00T.
Delaney, John H. Ventilation stop for windows. 4,222,596, Cl. 292-342.000.
Deleuze, Michel: *See—*
Boutin, Francois-Regis; Deleuze, Michel; Marchive, Daniel; and Reze, Rene, 4,222,774, Cl. 75-148.000.
Delignieres, Robert, to Institut Francias du Petrole. Digitally controlled fiber optic recording device. 4,222,630, Cl. 350-96.240.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., to Wisconsin Alumni Research Foundation. 25-Hydroxycholecalciferol-26,23-lactone. 4,223,131, Cl. 542-428.000.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Roll holder. 4,222,532, Cl. 242-55.200.
DeMascolo, Guy J. Bent wrist signal device. 4,222,569, Cl. 273-183.00B.
Demerson, Christopher A.: *See—*
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,223,151, Cl. 546-269.000.
den Brinker, Carl S., to Texas Instruments Incorporated. Linear amplifiers. 4,223,275, Cl. 330-257.000.
Dennison Manufacturing Company: *See—*
Jodrey, Robert M., 4,222,813, Cl. 156-540.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Amino derivatives of pyrido(2,3-d)pyridazine carboxylic acids and esters. 4,223,142, Cl. 544-236.000.
Deppe, Antonius, to Polysius AG. Cylindrical rotary kiln with satellite cooling tubes. 4,222,735, Cl. 432-80.000.
Derkach, Nikolai D.: *See—*
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.
DeRogatis, Ronald A. Vacuum packing apparatus. 4,222,276, Cl. 73-714.000.
DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,222,912, Cl. 260-23.0EP.
Zentner, Mark R.; Zahora, Edward P.; and Leo, Angelo F., 4,222,918, Cl. 260-29.2EP.
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Deutsche Babcock Aktiengesellschaft: *See—*
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Kleemann, Axel; Schalke, Peter; and Arnoldi, Detlef, 4,222,956, Cl. 260-465.400.
Pletka, Hans-Dieter; and Zezulka, Gerd, 4,222,930, Cl. 260-42.150.
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,222,995, Cl. 423-329.000.
Wolff, Siegfried; and Tan, Ewe H., 4,222,915, Cl. 260-23.70H.
DeVault, Robert L.: *See—*
McAlpine, James B.; and DeVault, Robert L., 4,223,024, Cl. 424-180.000.
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de Vries, Jochem J.: *See—*
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de Vries, Tjamme: *See—*
Boiten, Ebbe; Tietjens, Eduard W.; de Vries, Jochem J.; and de Vries, Tjamme, 4,222,168, Cl. 30-43.600.
Dewey, John L.; Scott, Charles E.; and Rushing, John C., to Reynolds Metals Company. Decomposition of aluminum nitrate. 4,223,000, Cl. 423-631.000.
Dewing, Kenneth F.: *See—*
Treadwell, Walter L.; and Dewing, Kenneth F., 4,222,581, Cl. 280-81.00R.
de Winter, Max S., to Akzona Incorporated. Novel delta 4,9 pregnane derivatives. 4,223,030, Cl. 424-242.000.
De Zuba, George P.: *See—*
Razzano, John S.; De Zuba, George P.; and Reo, Ned J., 4,222,917, Cl. 260-29.1SB.
Dhein, Rolf: *See—*
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Diamon Engineering Co., Ltd.: *See—*
Okuda, Masaaki; and Tomisaki, Kiyotaka, 4,222,769, Cl. 75-120.000.
Diamond International Corporation: *See—*
Nield, James M., 4,222,348, Cl. 119-17.000.
Diaz, Stephen H., to Raychem Corporation. Article having heating elements comprising conductive polymers capable of dimensional change. 4,223,209, Cl. 219-549.000.
Dickerson, Theodore, to Cities Service Company. Calcination of ferrite tans. 4,222,790, Cl. 106-304.000.
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Redlich, Horst; Hartmann, Werther; and Dickopp, Gerhard, 4,223,242, Cl. 310-316.000.
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, to Vyzkumny ustav bavlnarsky. Open-end frictional spinning apparatus. 4,222,222, Cl. 57-58.950.
Didier Engineering GmbH: *See—*
Flockenhaus, Claus; and Hartkopf, Edgar, 4,222,824, Cl. 201-41.000.
Di Fronzo, Antonio. Weighted service cloth. 4,223,056, Cl. 428-52.000.
Dilworth, James L.: *See—*
Kircher, Everett F.; and Dilworth, James L., 4,222,519, Cl. 239-14.000.
Dimmock Furniture Company Limited, The: *See—*
Dimmock, James, 4,222,607, Cl. 297-284.000.
Dimmock, James, to Dimmock Furniture Company Limited, The. Seating. 4,222,607, Cl. 297-284.000.
Dimovski, Milan R.: *See—*
Chamran, Morteza M.; and Dimovski, Milan R., 4,223,215, Cl. 250-211.00R.
Dimroth, Peter: *See—*
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Di Orazio, Dennis F.: *See—*
Hagenbach, Robert J.; Forgensi, Rudolph; Volkers, Stewart W.; and Di Orazio, Dennis F., 4,223,085, Cl. 430-108.000.
DiProspero, Peter. Gun cleaning device. 4,222,142, Cl. 15-104.165.
Dircks, Lon E.: *See—*
Bryant, Earle R.; Knittel, Gerald H.; and Dircks, Lon E., 4,222,925, Cl. 260-37.00N.
Director-General of the Agency of Industrial Science and Technology: *See—*
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.
Dixon, George D., to Westinghouse Electric Corp. In depth curing of resins induced by UV radiation. 4,222,835, Cl. 204-159.160.
Djurson, Sten: *See—*
Waerve, Hans; and Djurson, Sten, 4,223,230, Cl. 250-523.000.
Dobo, Emerick J., to Monsanto Company. Process to produce inorganic hollow fibers. 4,222,977, Cl. 264-63.000.
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., to American Home Products Corporation.

Process for preparing polycyclic heterocycles having a pyran ring. 4,223,151, Cl. 546-269.000.

Dr. Wachter Kurmittel GmbH: *See—*
Roth, Erich, 4,222,676, Cl. 401-28.000.

Doi, Yasushi: *See—*
Hashimoto, Takeji; Nagao, Yoshio; and Doi, Yasushi, 4,222,247, Cl. 66-75.200.

Dolby Laboratories, Inc.: *See—*
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Dolby, Ray M., to Dolby Laboratories, Inc. Scanning system for reproduction of optical sound tracks with clear area noise discriminator delay means. 4,223,188, Cl. 179-100.30A.

Dolhyj, Serge R.: *See—*
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,223,161, Cl. 562-534.000.

Domes, E. A.; and Vacval, Dusan M., to International Harvester Company. Mechanically actuated brake piston with elastomeric bushing. 4,222,463, Cl. 188-72.300.

Donachy, James H.; and Pierce, William S., to Donachy and Pierce. Blood pump and method of pumping blood. 4,222,127, Cl. 3-1.700.

Donachy and Pierce: *See—*
Donachy, James H.; and Pierce, William S., 4,222,127, Cl. 3-1.700.

Donahue, John W.: *See—*
Paranjpe, Suresh C.; and Donahue, John W., 4,223,320, Cl. 346-75.000.

Donahue, Joseph D., to Schweitzer Industrial Corporation. Paint spray booth with flooded floor. 4,222,319, Cl. 98-115.0SB.

Donermeyer, Donald D.; and Martins, Joseph G., to Monsanto Company. Cavity filling with a hot melt adhesive composition. 4,222,976, Cl. 264-36.000.

Doran, Robert W., to Raytheon Company. Color switching display system. 4,223,252, Cl. 315-375.000.

Dorian, Mark E.; and Nelson, David H., to American Solar Systems, Inc. Solar tracking device. 4,223,214, Cl. 250-203.00R.

Dornier System GmbH: *See—*
Ernsberger, Klaus; and Meier, Helmut, 4,223,259, Cl. 318-648.000.

Douglas, William: *See—*
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Dow Chemical Company, The: *See—*
Larson, Larry L., 4,223,026, Cl. 424-200.000.
Rigterink, Raymond H., 4,223,025, Cl. 424-200.000.

Dow Corning Corporation: *See—*
Baney, Ronald H.; and Harris, Len A., 4,223,072, Cl. 428-412.000.
Mahone, Louis G., 4,222,953, Cl. 260-466.000.

Doyle, Walter V., to Flex-O-Line Division of Kenton Machine Works. Doctor blade liquid applicator for metering rolls. 4,222,328, Cl. 101-350.000.

Drabek, Jozef: *See—*
Boger, Manfred; and Drabek, Jozef, 4,223,027, Cl. 424-211.000.

Drabowitch, Serge, to Thomson-CSF. Antenna structure with relatively offset reflectors for electromagnetic detection and space telecommunication equipment. 4,223,316, Cl. 343-781.00P.

Dravo Corporation: *See—*
Good, Robert D., deceased; and Quenin, Paul P., 4,222,851, Cl. 208-45.000.
Ramirez, Ernest R., 4,222,872, Cl. 423-57.000.

Dray, Sheldon: *See—*
Teodorescu, Marius C.; Mayer, Eugene P.; and Dray, Sheldon, 4,223,005, Cl. 424-12.000.

Drechsel, Erhart K., to Pennzoil Company. Production of fluoride-free phosphates. 4,222,990, Cl. 423-158.000.

Drees, Paul A.: *See—*
Aluotto, Patrick F.; and Drees, Paul A., 4,222,919, Cl. 260-29.40R.

Drewery, John O., to British Broadcasting Corporation. Circuitry providing a delayed color television signal having luminance and chrominance components derived from adjacent lines. 4,223,341, Cl. 358-36.000.

Drews, Ulrich; Werner, Peter; Moder, Helmut; and Kugelmann, Adolf, to Robert Bosch GmbH. Electrically controlled fuel injection system. 4,222,352, Cl. 123-484.000.

Drilling, Joseph C.: *See—*
Cox, Russell; Drilling, Joseph C.; and Reed, Ronald H., 4,222,627, Cl. 339-147.00R.

Drobny, Vladimir F.: *See—*
Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., 4,223,308, Cl. 340-719.000.

Drone, Gary A.; and Levin, Evsey P., to Fiat-Allis Construction Machinery, Inc. Multiple control locking device. 4,222,287, Cl. 74-529.000.

Drouet, Jacques L.; and Tournere, Marcel J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for the impact cooling of the turbine packing rings of a turbojet engine. 4,222,707, Cl. 415-116.000.

DuBell, Thomas L.: *See—*
Bobo, Melvin; and DuBell, Thomas L., 4,222,230, Cl. 60-39.360.

Dubois, Jean-Claude; Nguyen, Tinh H.; and Zann, Annie, to Thomson-CSF. Liquid crystal materials containing a diphenylethane nucleus. 4,222,888, Cl. 252-299.000.

Dubuque Packing Company: *See—*
Whitney, Edward A.; and Weiss, Gerald M., 4,222,741, Cl. 8-94.160.

DuCharme, Robert T.: *See—*
Kluger, Michael A.; and DuCharme, Robert T., 4,222,467, Cl. 188-79.5GE.

Dudas, Richard M.: *See—*
Persico, Thomas M.; Dudas, Richard M.; and Shusta, George W., 4,223,229, Cl. 250-515.000.

Duewel, Ronald E., to LOF Plastics, Inc. Hot air edge banding machine. 4,222,812, Cl. 156-497.000.

Dugan, Larry M.; and McMillin, Danny L., to Coors Container Company. Container conveying and transfer system. 4,222,479, Cl. 198-482.000.

Duhl, David N.: *See—*
Schweizer, Frederick A.; and Duhl, David N., 4,222,794, Cl. 148-3.000.

Dunbar, John P.: *See—*
Weirich, James F., 4,222,315, Cl. 98-37.000.

Duncan, Eugene F.: *See—*
Bongard, James A.; Duncan, Eugene F.; and Jaeschke, James R., 4,223,217, Cl. 250-227.000.

Dunham-Bush, Inc.: *See—*
Shaw, David N., 4,222,716, Cl. 417-310.000.

Dunn, Robert E.; and Smith, Edward H., to Westinghouse Electric Corp. Tool supporting arm and mounting plate with a plurality of quick disconnect mounts for multiple arms. 4,222,699, Cl. 414-750.000.

Du Pont de Nemours, E. I., and Company: *See—*
Berghmans, Jacques M. L., 4,223,069, Cl. 428-324.000.
Brixius, Darryl W.; and Simms, John A., 4,222,909, Cl. 260-18.0TN.
Chow, Allan T., 4,223,207, Cl. 219-494.000.
Hazan, Isidor, 4,222,837, Cl. 204-181.00C.
Jacobson, Howard W., 4,222,789, Cl. 106-300.000.
Nelson, Thomas L., 4,222,223, Cl. 57-246.000.
Rees, Richard W., 4,222,922, Cl. 260-29.6BE.
Schumacher, Frederick G., 4,222,924, Cl. 260-33.6UA.
Taylor, Barry E., 4,223,077, Cl. 429-191.000.
Webster, Donald A.; Johnson, Lake H.; and Romanauskas, William A., 4,222,513, Cl. 233-26.000.

Durango Systems, Inc.: *See—*
Plaza, Mario G.; and Waibel, Helmut K., 4,222,673, Cl. 400-56.000.

Durrieu, Marc: *See—*
Scherrer, Claude; Durrieu, Marc; and Richmond, John R., 4,222,853, Cl. 208-48.0AA.

Duval, Andre; and Lime, Bernard, to Societe Anonyme D.B.A. Tool for fitting a resilient ring into a groove. 4,222,161, Cl. 29-235.000.

Dynatherm Corporation: *See—*
Pravda, Milton F., 4,222,436, Cl. 165-105.000.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,223,142, Cl. 544-236.000.

Eastman Kodak Company: *See—*
Foster, Charles H., 4,222,949, Cl. 260-397.250.
Merrill, Stewart H.; and Santilli, Domenic, 4,223,086, Cl. 430-119.000.
Rosenfeld, Robert B., 4,223,082, Cl. 430-3.000.
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Eaton Corporation: *See—*
Bongard, James A.; Duncan, Eugene F.; and Jaeschke, James R., 4,223,217, Cl. 250-227.000.
Garrett, Wayne H.; and Neuman, Richard F., 4,222,310, Cl. 92-128.000.
Geppert, Steven, 4,222,491, Cl. 212-153.000.
Kubolis, William J.; and Chun, Victor L., 4,222,469, Cl. 192-4.00A.
Uitvlugt, Martin W., 4,222,354, Cl. 123-90.160.

Ebert, Hans, to Siemens Aktiengesellschaft. Recording device. 4,223,325, Cl. 346-145.000.

Eckels, Phillip W., to Electric Power Research Institute, Inc. Multiphasic pump for rotating cryogenic machinery. 4,223,239, Cl. 310-52.000.

Eckels, Thomas L., to United States of America, Army. Human speech envelope tracker. 4,223,180, Cl. 179-1.0SC.

Eckerle, Joseph: *See—*
Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., 4,222,675, Cl. 400-474.000.

Eckert, Frederick J.: *See—*
Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., 4,222,808, Cl. 156-245.000.

Edamoto, Yoshito. Sliding nozzle apparatus for blowing powdery treating agent. 4,222,553, Cl. 266-47.000.

Edwards, Robert, to White Consolidated Industries, Inc. Mounting means for movable carriage on an offset press. 4,222,325, Cl. 101-137.000.

Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, to Hoechst Aktiengesellschaft. Solvent extraction purification of wet-processed phosphoric acid. 4,222,994, Cl. 423-321.00S.

Eichweber, Kurt. Light receiving and reflecting device. 4,222,632, Cl. 350-102.000.

Eilandgebied Curacao: *See—*
Eisden, Remilio L., 4,222,825, Cl. 203-11.000.

Eilert, Richard L. Humidifier liner. 4,222,971, Cl. 261-92.000.

Eimen, Shawn H., to Milsco Manufacturing Company. Hydraulic cushioning device for vehicle seat. 4,222,555, Cl. 267-131.000.

Eisden, Remilio L., to Eilandgebied Curacao. Process and an installation for the treatment of water. 4,222,825, Cl. 203-11.000.

Electric Power Research Institute, Inc.: *See—*
Eckels, Phillip W., 4,223,239, Cl. 310-52.000.

Sweetana, Andrew S., Jr.; Gupta, Tapan K.; Kothmann, Richard E.; and Osterhout, Joseph C., 4,223,366, Cl. 361-127.000.

Elgin Sweeper Company: *See—*
Kieft, Gerald N.; and Hildebrand, Donald L., 4,222,141, Cl. 15-84.000.

El-Habr, Michel E. Glass scoring apparatus. 4,222,300, Cl. 83-886.000.

Eli Lilly and Company: *See—*
Bunnell, Charles A., 4,223,133, Cl. 544-16.000.
Lappas, Lewis C.; Lorenz, Leslie J.; and Wikel, James H., 4,223,153, Cl. 548-163.000.
Wright, Ian G., 4,223,134, Cl. 544-26.000.

Ellingson, Herman E., to United States of America, Navy. Long range listening system. 4,223,311, Cl. 343-112.00D.

Elliott Brothers (London) Limited: *See—*
Barowitz, Peter J.; and Baxendale, Roy, 4,223,304, Cl. 340-566.000.
Beasley, Robin D., 4,222,664, Cl. 356-73.100.

Elopak A/S: *See—*
Frydendal, Tom, 4,222,579, Cl. 280-33.99H.

Elston, Colin: *See—*
Jones, Newlyn; Stewart, Alistair C.; and Elston, Colin, 4,222,821, Cl. 162-164.00R.

Elter, John F., to Xerox Corporation. Conformable/non-conformable roll fuser. 4,223,203, Cl. 219-216.000.

Eme, Elain M., administratrix: *See—*
Eme, Robert, deceased; and Schuman, Lloyd P., 4,222,624, Cl. 339-91.00R.

Eme, Robert, deceased (by Eme, Elain M., administratrix); and Schuman, Lloyd P., to Midway Mfg. Co. Interface wafer for printed circuit board. 4,222,624, Cl. 339-91.00R.

Emhart Industries, Inc.: *See—*
Braithwaite, David, 4,222,761, Cl. 65-207.000.
Braithwaite, David, 4,222,762, Cl. 65-226.000.

EMI Limited: *See—*
Hounsfield, Godfrey N.; and Gollifer, MacArthur J., 4,223,384, Cl. 364-414.000.

EMM Semi, Inc.: *See—*
Hartman, John M.; and Leach, George S., 4,222,165, Cl. 29-579.000.

Emmer, Steven S.: *See—*
Sternberg, Shmuel; and Emmer, Steven S., 4,222,870, Cl. 210-639.000.

Enders, George E., to NRM Corporation. Servicer for a tire building drum. 4,222,811, Cl. 156-406.000.

Endress & Hauser GmbH & Co.: *See—*
Sartorius, Wilfried; and Stock, Don J. R., 4,223,267, Cl. 368-118.000.

Engdahl, Paul D. Passive multielement shock recorder. 4,223,319, Cl. 346-7.000.

Engelhard, Thomas E. Window boot. 4,222,605, Cl. 296-166.000.

Engelking, Paul C.: *See—*
Colson, Steven D.; Engelking, Paul C.; and Turner, Robert E., 4,223,278, Cl. 331-94.5PE.

Engels, Walter, to Milliken Research Corporation. Pile fabric sculpturing apparatus. 4,222,158, Cl. 26-16.000.

Engineering & Research Associates, Inc.: *See—*
Acker, Loren C., 4,222,366, Cl. 126-415.000.

Engle, George M., Jr., to Pacific Western Systems. Plasma enhanced chemical vapor processing of semiconductive wafers. 4,223,048, Cl. 427-39.000.

Englehart, John D. Underdrain filter system. 4,222,876, Cl. 210-293.000.

English, Anthony E. Visual teaching device. 4,222,180, Cl. 35-43.000.

English Electric Company Limited, The: *See—*
Broster, David L., 4,223,299, Cl. 340-166.00R.

Engstrom, Frederic R., to Tektronix, Inc. Virtual mask exposure system for CRT screen manufacture. 4,223,083, Cl. 430-24.000.

Enokimoto, Norio: *See—*
Mizuno, Shioji; and Enokimoto, Norio, 4,222,926, Cl. 260-40.00R.

Enrietti, Leo; and Enrietti, Piero. Molding press for plastic materials. 4,222,731, Cl. 425-451.500.

Enrietti, Piero: *See—*
Enrietti, Leo; and Enrietti, Piero, 4,222,731, Cl. 425-451.500.

Ensley, Rufus N.: *See—*
McLean, Michael E.; Ensley, Rufus N.; Alcaraz, Anthony J.; and Caldwell, Paul E., 4,222,809, Cl. 156-267.000.

Enterprise d'Equipments Mechaniques et Hydrauliques, E.M.H.: *See—*
Vilain, Robert, 4,222,682, Cl. 405-203.000.

Erikson, J. Alden: *See—*
Christenson, Roger M.; and Erikson, J. Alden, 4,222,911, Cl. 260-22.0TN.

Erlandson, Paul M.; Ullery, Lee R.; and Brigham, Roger S., to Continental Can Company Inc. Welded tubular articles and method for making the same. 4,223,196, Cl. 219-61.200.

Ernsberger, Klaus; and Meier, Helmut, to Dornier System GmbH. Apparatus for supporting a body in a desired angular position. 4,223,259, Cl. 318-648.000.

ESB Technology Company: *See—*
Margalit, Nehemiah; and Maroney, Robert A., 4,223,079, Cl. 429-194.000.

Escher Wyss Aktiengesellschaft: *See—*
Biondetti, Mario, 4,222,324, Cl. 100-47.000.
Lehmann, Rolf, 4,222,255, Cl. 72-20.000.

Eshelman, Philip V., to Colt Industries Operating Corp. Pulse generating means. 4,223,249, Cl. 315-209.00M.

Espenschied, Helmut, to Robert Bosch GmbH. Limit switch for D-C positioning motor. 4,223,256, Cl. 318-282.000.

Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., to Bayer Aktiengesellschaft. Flame-resistant polyurethane foam and a process for its production. 4,223,095, Cl. 521-55.000.

Essilor International, Cie Generale d'Optique: *See—*
Dauguet, Jean-Claude; Mazzone, Jean-Pierre; and Moreau, Pierre, 4,222,747, Cl. 51-301.000.

Estes, John H.; and Buinicky, Ernest P., to Texaco Inc. Enhanced recovery of petroleum. 4,222,439, Cl. 166-272.000.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,222,958, Cl. 260-559.00D.

Etablissements Staubli: *See—*
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Ethyl Corporation: *See—*
Clinton, Ernest, 4,222,883, Cl. 252-52.00R.
Malec, Robert E., 4,222,884, Cl. 252-52.00R.

Evans, Arthur D.: *See—*
Leavens, Richard; and Evans, Arthur D., 4,222,363, Cl. 126-77.000.

Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., to Lilly Industries, Limited. Acylamino furan derivatives. 4,222,946, Cl. 260-347.300.

Evans, Samuel Cornelious: *See—*
Richardson, Robert H., 4,222,517, Cl. 235-493.000.

Everlast World's Boxing Headquarters Corp.: *See—*
Toms, John L., 4,222,122, Cl. 2-9.000.

Ewertsson, Bengt R. E.: *See—*
Bengtsson, Alf R. A.; Carlborg, John L.; and Ewertsson, Bengt R. E., 4,222,507, Cl. 223-37.000.

Exxon Research & Engineering Co.: *See—*
Kmak, Walter S.; and Yatabe, Akira, 4,222,852, Cl. 208-48.00R.
Makowski, Henry S.; Klein, Robert R.; Lundberg, Robert D.; and Bock, Jan, 4,222,914, Cl. 260-23.70B.
Moss, Gerald, 4,222,749, Cl. 55-18.000.
Nizamoff, Alan J., 4,222,844, Cl. 208-8.0LE.
Parsons, Patrick J., 4,222,873, Cl. 210-777.000.
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., 4,222,986, Cl. 422-131.000.
White, Kevin E., 4,223,261, Cl. 318-721.000.

Eymard, Pierre: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, 4,223,041, Cl. 424-322.000.

F. C. Schaffer & Associates, Inc.: *See—*
Olewinski, William J.; Smith, Teddy G.; and Papizan, John L., 4,222,140, Cl. 14-71.300.

F. J. Littell Machine Company: *See—*
Johnson, Kenneth C., 4,222,256, Cl. 72-164.000.

Faber, Peter, to Rheinisch-Westfalisches Elektrizitats Werk AG. Composite electrode for storage batteries and the like. 4,223,081, Cl. 429-234.000.

Fabiani, Paul M. P.: *See—*
Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, 4,223,039, Cl. 424-275.000.

Fabri-Coate Company, Inc.: *See—*
Start, Rick E.; Woldring, Bert; and Parker, Cliff, 4,222,496, Cl. 222-16.000.

Fachini, Robert M.; and Lester, William D., to International Harvester Company. Power steering mechanism for cotton pickers. 4,222,452, Cl. 180-162.000.

Factory Mutual Research Corporation: *See—*
Williams, John W., 4,222,402, Cl. 137-87.000.

Faerber, Nelson A.: *See—*
Bonner, Edgar L.; and Faerber, Nelson A., 4,223,295, Cl. 340-32.000.

Fagersta AB: *See—*
Degerbeck, Jorgen, 4,222,773, Cl. 75-125.000.

Fajt, Ludvik: *See—*
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

Falconi, Giovanni: *See—*
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; and Scarponi, Ugo, 4,223,146, Cl. 546-118.000.

Falk, Richard. Molten metal sample ladle with vent tube. 4.222,269, Cl. 73-425.40R.

Fancher, Llewellyn W., to Stauffer Chemical Company. Butynylamide phosphate and phosphonates and method for controlling insects. 4,223,028, Cl. 424-211.000.

Fannin, Loyd W.; and Malpass, Dennis B., to Texas Alkyls, Inc. Hydrocarbon soluble magnesium compositions of high magnesium content. 4,222,969, Cl. 260-665.00R.

Farber, Joseph. Ridged surface solar heater. 4,222,807, Cl. 156-244.130.

Farmitalia Carlo Erba S.p.A.: *See—*
Arcari, Giuliana; Bernardi, Luigi; Falconi, Giovanni; and Scarponi, Ugo, 4,223,146, Cl. 546-118.000.

Feichtmayr, Franz: *See—*
Kast, Hellmut; Grychtol, Klaus; and Feichtmayr, Franz, 4,223,144, Cl. 544-392.000.

Feistel, Karl H., to Wandel & Goltermann GmbH & Co. Four-terminal network of adjustable transfer function. 4,223,272, Cl. 330-51.000.

Feliz, Jack M. Step-climbing wheel chair. 4,222,449, Cl. 180-8.00A.

Fenart, Jean Claude, to Societe Anonyme Francaise du Ferodo. Torsion damping device, particularly for a motor vehicle clutch. 4,222,475, Cl. 192-106.200.

Ferranti Limited: *See—*
Kane, Jeffrey, 4,223,335, Cl. 357-48.000.

Ferro Corporation: *See*—
Barda, Henry J., 4,223,169, Cl. 568-645.000.
Ferruti, Paolo; and Paoletti, Rodolfo. Therapeutic compositions containing polymers having polyunsaturated acid radicals. 4,223,011, Cl. 424-81.000.
Ferver, George W. Modular homes. 4,222,208, Cl. 52-169.500.
Feuerbaum, Hans P., to Siemens Aktiengesellschaft. Method for electronically imaging the potential distribution in an electronic component and arrangement for implementing the method. 4,223,220, Cl. 250-310.000.
Fiat-Allis Construction Machinery, Inc.: *See*—
Drone, Gary A.; and Levin, Evsey P., 4,222,287, Cl. 74-529.000.
Field, Michael F., to Co-Steel International Limited. Mill stand. 4,222,258, Cl. 72-239.000.
Finch, Robert E., to Nalco Chemical Company. Treatment and recovery of larger particles of fine oxidized coal. 4,222,861, Cl. 209-166.000.
Finch, Robert E., to Nalco Chemical Company. Flotation of oxidized coal with a latex emulsion of sodium polyacrylate used as a promoter. 4,222,862, Cl. 209-166.000.
Fine, Jerome; and De Tora, Sigismondo A., to Inmont Corporation. Method of producing fibrous structure. 4,223,101, Cl. 528-76.000.
Fink, Fritz, to BASF Aktiengesellschaft. Preservative for animal feeds. 4,223,045, Cl. 426-335.000.
Firestone Tire & Rubber Company, The: *See*—
Gado, Victor C., 4,222,721, Cl. 425-33.000.
Hergenrother, William L.; and Halasa, Adel F., 4,223,102, Cl. 528-168.000.
Schulz, Donald N.; and Kang, Jung W., 4,223,103, Cl. 528-168.000.
Fischer, Gert: *See*—
Hassler, Heinrich; Grosse, Joachim; Fischer, Gert; and Hannich, Joachim, 4,222,167, Cl. 29-875.000.
Fisher, David C.: *See*—
Forman, Hugh M., 4,222,157, Cl. 24-129.00A.
Fisher, Mary F.: *See*—
Forman, Hugh M., 4,222,157, Cl. 24-129.00A.
Fishman, Iosif D. Y.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.
Fisons Limited: *See*—
Gates, Peter S.; and Baldwin, Derek, 4,222,767, Cl. 71-103.000.
Fitzmayer, Louis H., to General Electric Company. Microwave oven with means for modifying energy distribution therein. 4,223,194, Cl. 219-10.55F.
Fixsen, Hubert; and Skime, Roger, to Arctic Enterprises, Inc. Rear suspension system for a snowmobile. 4,222,453, Cl. 180-193.000.
Flex-O-Line Division of Kenton Machine Works: *See*—
Doyle, Walter V., 4,222,328, Cl. 101-350.000.
Flockenhaus, Claus; and Hartkopf, Edgar, to Didier Engineering GmbH; and Bergwerksverband GmbH. Recuperative coke oven and process for the operation thereof. 4,222,824, Cl. 201-41.000.
Flowers, Robert H.: *See*—
Harrigan, William C., Jr.; Flowers, Robert H.; and Hudson, Silas P., 4,223,075, Cl. 428-610.000.
Flowers, Woodie C.: *See*—
Antonsson, Erik K.; and Flowers, Woodie C., 4,222,382, Cl. 128-303.00R.
Fluckiger, Friedrich: *See*—
Marti, Heinrich; and Fluckiger, Friedrich, 4,222,433, Cl. 164-448.000.
Flynn, Thomas P., to Super Products Corporation. System for opening and closing doors to a vacuum body. 4,222,404, Cl. 137-205.000.
FMC Corporation: *See*—
Haley, Frank P., 4,222,591, Cl. 285-18.000.
Price, John A.; and Orwoll, Edward F., 4,223,159, Cl. 560-205.000.
Fobbs, Hiram. Electrical drive for automobile. 4,222,450, Cl. 180-65.00D.
Focke, Heinz. One-piece container having an integral handle. 4,222,485, Cl. 206-141.000.
Ford Motor Company: *See*—
Davies, Richard G., 4,222,796, Cl. 148-12.00F.
Mylenek, Chester, 4,222,281, Cl. 74-339.000.
Springer, Jerry L.; Wells, Charles M.; and Horn, William F., 4,223,293, Cl. 338-34.000.
Forgensi, Rudolph: *See*—
Hagenbach, Robert J.; Forgensi, Rudolph; Volkers, Stewart W.; and Di Orazio, Dennis F., 4,223,085, Cl. 430-108.000.
Forman, Hugh M., to Fisher, David C.; and Fisher, Mary F. Rope tightener. 4,222,157, Cl. 24-129.00A.
Forster, Eckehard: *See*—
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased, 4,222,257, Cl. 72-201.000.
Fosnow, Wesley C.: *See*—
Allen, Donnie E.; Kilmer, Robert; Guy, Thomas L.; and Fosnow, Wesley C., 4,222,564, Cl. 273-369.000.
Fossum, Greta K.; and Haggstrom, Sten L., to Mo och Domsjo Aktiebolag. Process for the acid bleaching of cellulose pulp with peroxides. 4,222,819, Cl. 162-76.000.
Foster, Charles H., to Eastman Kodak Company. Process for separating stigmasterol-derived products (II). 4,222,949, Cl. 260-397.250.
Foundry Management, Inc.: *See*—
Kemp, Willard E., 4,222,429, Cl. 164-34.000.
Fraser, John M., to Bell Telephone Laboratories, Incorporated. Transmission of signals with privacy. 4,223,182, Cl. 179-1.50R.
Freed, William T.: *See*—
Halek, George W.; Freed, William T.; Schaul, Jerome S.; Rupp, Raymond W.; and Pauls, Stanley L., 4,223,128, Cl. 528-481.000.
Freeman Chemical Corporation: *See*—
Carlstrom, William L.; Reineck, Ronald W.; and Svoboda, Glenn R., 4,223,068, Cl. 428-310.000.
Friedman, Conchetta. Cookware. 4,222,493, Cl. 220-8.000.
Fritzsche Dodge & Olcott Inc.: *See*—
Willis, Brian J.; Christenson, Philip A.; and Barton, Derek H. R., 4,223,167, Cl. 568-820.000.
Fromman, Arthur R. A. Electrically powered hair rolling device. 4,222,398, Cl. 132-34.00R.
Frosch, Albert; Holzinger, Gerhard; Jaerisch, Walter; and Scheuing, Claus, to International Business Machines Corporation. Interferometer for determining the shape of an object. 4,222,669, Cl. 356-360.000.
Fry, Andrew R.: *See*—
Crew, Eric W.; Harvey, Peter; and Fry, Andrew R., 4,223,175, Cl. 174-15.00R.
Frydendal, Tom, to Elopak A/S. Nestable trolley with volume regulation. 4,222,579, Cl. 280-33.99H.
Fryer, John L.: *See*—
Garrison, Robert L.; Gould, Rowan W.; O'Leary, Patrick J.; and Fryer, John L., 4,223,014, Cl. 424-92.000.
Fuhrer, Jack S.: *See*—
Lagoni, William A.; and Fuhrer, Jack S., 4,223,339, Cl. 358-31.000.
Fuji Electric Co., Ltd.: *See*—
Miyatake, Osamu; Murakami, Hirotake; and Hishinuma, Masakatsu, 4,222,226, Cl. 368-113.000.
Fuji Kinzoku Kohsaku Co., Ltd.: *See*—
Sonoda, Yoshiteru, 4,222,403, Cl. 137-183.000.
Fuji Koeki Corporation: *See*—
Takematsu, Yoshiyuki, 4,223,372, Cl. 362-8.000.
Fuji Photo Film Co., Ltd.: *See*—
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.
Fujibyora Co., Ltd.: *See*—
Fujiwara, Isamu, 4,222,689, Cl. 85-41.000.
Fujii, Osamu; Takano, Misao; Uotani, Takeshi; and Iwamoto, Eiji, to Toyo Soda Manufacturing Co., Ltd. Process for purifying crude isoindolinone series pigments. 4,223,152, Cl. 546-273.000.
Fujikake, Kenji: *See*—
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,222,710, Cl. 416-236.00A.
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueda, Yoshiteru, to Kawasaki Jukogyo Kabushiki Kaisha. Internal combustion engine having engine cover. 4,222,360, Cl. 123-195.00C.
Fujita, Akira: *See*—
Takahara, Takeshi; Nishimura, Toshio; and Fujita, Akira, 4,222,890, Cl. 252-301.40P.
Fujita, Kiyohiko: *See*—
Hijikata, Toshio; Yamazaki, Takao; and Fujita, Kiyohiko, 4,222,799, Cl. 148-143.000.
Fujita, Masayuki: *See*—
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,222,522, Cl. 239-160.000.
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, to Kuraray Co., Ltd. Substituted propargyl alcohols, allylic alcohols and unsaturated ketones, and methods for the production thereof. 4,222,963, Cl. 568-384.000.
Fujiwara, Isamu, to Fujibyora Co., Ltd. Drilling and tapping screw. 4,222,689, Cl. 85-41.000.
Fujiwara, Takeji: *See*—
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,223,327, Cl. 357-15.000.
Fujiwara, Toshihide: *See*—
Suzuki, Hideo; Fujiwara, Toshihide; and Kaneko, Nobutaka, 4,222,843, Cl. 204-299.00R.
Fukuhara, Akira: *See*—
Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, 4,223,187, Cl. 179-100.10G.
Fukuyama, Hiroshi: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.
Funakoshi, Hisashi: *See*—
Kojima, Hideto; and Funakoshi, Hisashi, 4,223,337, Cl. 357-68.000.
Furda, Ivan. Nonabsorbable lipid binder. 4,223,023, Cl. 424-180.000.
Furuichi, Katsushi; Honma, Toshio; and Murakami, Katsumi, to Canon Kabushiki Kaisha. Image forming device with automatic mode setting. 4,222,660, Cl. 355-14.00R.
Furukawa, Masamichi, to Ricoh Company, Ltd. Integrating circuit. 4,223,271, Cl. 328-127.000.
Futaba Denshi Kogyo K.K.: *See*—
Kishino, Takao; Kawasaki, Kishio; and Yamaguchi, Nobuo, 4,223,244, Cl. 313-497.000.
G. D. Searle & Co.: *See*—
Bruhn, Mildred S.; and Pappo, Raphael, 4,223,158, Cl. 560-121.000.
Chorvat, Robert J., 4,223,136, Cl. 544-34.000.
Gabbert, James D.: *See*—
Hedrick, Ross M.; and Gabbert, James D., 4,223,112, Cl. 525-432.000.
Gado, Victor C., to Firestone Tire & Rubber Company, The. Apparatus for curing tires and the like. 4,222,721, Cl. 425-33.000.
GAF Corporation: *See*—
Chakrabarti, Paritosh M., 4,223,009, Cl. 424-47.000.

Gage, Paul E.; and Church, Richard O., to Polymer Corporation, The. Resilient center plate assembly. 4,222,331, Cl. 105-199.00C.

Gaillard, Jacques: *See—*
Caspar, Jean-Pierre; and Gaillard, Jacques, 4,222,784, Cl. 106-93.000.

Gakken Co., Ltd.: *See—*
Kurosawa, Kenzo; and Hachimura, Fukuji, 4,222,195, Cl. 46-202.000.

Gale, Michael S.: *See—*
Gale, Myron C.; and Gale, Michael S., 4,222,599, Cl. 294-12.000.

Gale, Myron C.; and Gale, Michael S. Dutch oven lifting device. 4,222,599, Cl. 294-12.000.

Galvagni, Alighiero, to Ing. C. Olivetti & C., S.p.A. Flexible magnetic disk recording apparatus. 4,223,359, Cl. 360-99.000.

Gambini, Michael R.; and Benenson, Gary, to Picker Corporation. Scintillation camera uniformity correction. 4,223,221, Cl. 250-363.00S.

Gammel, Josef, to Siemens Aktiengesellschaft. Directive radio communication transmission system for maintaining the alignment of transmission and receiver antenna. 4,223,312, Cl. 343-117.00R.

Gammons, Robert C.: *See—*
Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., 4,222,808, Cl. 156-245.000.

Garcia, Alfred B.: *See—*
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,223,092, Cl. 435-55.000.

Garcia, Robert. Shower head mixer. 4,222,524, Cl. 239-315.000.

Gardeski, Thomas F.: *See—*
Caldwell, Donald B.; and Gardeski, Thomas F., 4,223,073, Cl. 428-422.000.

Gardner, Denys. Broom for broom ball game. 4,222,562, Cl. 273-67.00R.

Garland Manufacturing Co.: *See—*
Garland, Theodore F., 4,222,867, Cl. 209-427.000.

Garland, Theodore F., to Garland Manufacturing Co. Coal cleaner. 4,222,867, Cl. 209-427.000.

Garrett, Wayne H.; and Neuman, Richard F., to Eaton Corporation. Brake actuator fastener assembly. 4,222,310, Cl. 92-128.000.

Garrison, Robert L.; Gould, Rowan W.; O'Leary, Patrick J.; and Fryer, John L., to United States of America, Interior. Spray immunization of fish. 4,223,014, Cl. 424-92.000.

Gartner, Klaus W.: *See—*
Uyeda, Tim M., 4,222,251, Cl. 70-1.500.

Gasner, John T.; and Rivoli, Anthony L., to Harris Corporation. High voltage CMOS with local oxidation for self-aligned guard rings and process of fabrication. 4,223,334, Cl. 357-42.000.

Gasser, Markus, to SIG-Schweizerische Industrie-Gesellschaft. Article feeding system for parallel-operating machines. 4,222,478, Cl. 198-358.000.

Gates, Peter S.; and Baldwin, Derek, to Fisons Limited. Certain herbicidal sulfonates and sulfamates. 4,222,767, Cl. 71-103.000.

Gattermeir, J. David: *See—*
Bacon, Duane E.; Gattermeir, J. David; and Hrivnak, Bonnie J., 4,222,834, Cl. 204-129.600.

Gaudilliere, Bernard: *See—*
Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, 4,223,039, Cl. 424-275.000.

Gauthier, William D.; Hendricks, Merl J.; and Babcock, Robert L., to Champion Spark Plug Company. Oxygen enrichment system for medical use. 4,222,750, Cl. 55-58.000.

Geba Geratebau GmbH, Firma: *See—*
Schmidt, Karin, 4,222,153, Cl. 17-73.000.

Gebhart, John R.; Kinchen, Bruce E.; and Strange, Richard R., to United Technologies Corporation. Optical pyrometer and technique for temperature measurement. 4,222,663, Cl. 356-45.000.

Gebrueder Buehler AG: *See—*
Hurni, Samuel. 4,222,736, Cl. 432-80.000.
Keller, Alois, 4,222,864, Cl. 209-284.000.

Gedig, Alfred; and Becker, Burckhard, to Rob. Hammerstein GmbH. Vertical and angular adjustment device for vehicle seats. 4,222,543, Cl. 248-394.000.

Geimer, Josef, to Turk & Bolte. Outlet fixture for fluid media. 4,222,410, Cl. 137-606.000.

Gellert, Jobst U.; and Krause, Peter, to Mold-Masters Limited. Injection molding flow control mechanism. 4,222,733, Cl. 425-566.000.

General Dynamics Corporation: *See—*
Lacy, Garry T., 4,223,258, Cl. 318-599.000.

General Dynamics Corporation Pomona Division: *See—*
Schmid, Hans-Peter; and Schlunt, Richard S., 4,223,270, Cl. 328-112.000.

General Electric Company: *See—*
Adamson, Arthur P., 4,222,234, Cl. 60-226.00R.
Adamson, Arthur P.; and Sprunger, Elmore V., 4,222,235, Cl. 60-226.00R.
Albinger, Harry, Jr., 4,223,303, Cl. 340-531.000.
Bobo, Melvin; and DuBell, Thomas L., 4,222,230, Cl. 60-39.360.
Cella, James A., 4,223,122, Cl. 528-30.000.
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,223,373, Cl. 362-13.000.
Davison, Samuel H., 4,222,708, Cl. 415-127.000.
Fitzmayer, Louis H., 4,223,194, Cl. 219-10.55F.
Gray, David A.; Sivertsen, Marvin L.; Adam, Jerome H.; and Prendergast, John F., Sr., 4,223,222, Cl. 250-363.00S.
Johnson, James E.; Castells, Onofre T. M.; and Rundell, Dan J., 4,222,233, Cl. 60-225.000.
Krystyniak, Casimir W., 4,222,330, Cl. 102-38.00R.
Mark, Victor, 4,223,170, Cl. 568-721.000.
Mark, Victor; and Hedges, Charles V., 4,223,171, Cl. 568-726.000.
Noble, Milton L.; Craig, Samuel E.; and Hoefer, William G., 4,223,354, Cl. 358-233.000.
Razzano, John S.; De Zuba, George P.; and Reo, Ned J., 4,222,917, Cl. 260-29.1SB.
Scannell, Edward F., 4,223,266, Cl. 324-154.00R.
Simcoe, Robert J., 4,223,379, Cl. 364-104.000.

General Extrusions, Inc.: *See—*
Rost, Duane F.; and Ameduri, Gene J., 4,222,368, Cl. 126-438.000.

General Motors Corporation: *See—*
Bhagat, Jayant K.; and Steele, Martin C., 4,222,838, Cl. 204-192.00E.
Cripps, David J.; and Kwasiborski, Stanley, Jr., 4,222,600, Cl. 296-37.100.
Grindahl, Robert B., 4,222,793, Cl. 148-2.000.
Hegedus, Louis; Oh, Se H.; and Baron, Kenneth, 4,222,236, Cl. 60-274.000.
Karklins, Elgin J.; and Spindler, Charles W., 4,222,805, Cl. 156-184.000.
Kopich, Leonard F., 4,222,473, Cl. 192-43.100.
Mason, George W., 4,222,172, Cl. 33-174.00C.
Murphy, Michael P.; and Hillebrand, George W., 4,222,840, Cl. 204-195.00S.
Nagy, Laszlo, 4,222,283, Cl. 74-467.000.
Pigeon, Dale W., 4,222,202, Cl. 49-352.000.

General Tire & Rubber Company, The: *See—*
Shanoski, Henry; and Reichenbach, Donald F., 4,222,929, Cl. 260-40.0TN.

Genik-Sas-Berezowsky, Roman M.: *See—*
Weir, Donald R.; Vosahlo, Eva A.; and Genik-Sas-Berezowsky, Roman M., 4,222,999, Cl. 423-557.000.

George Fischer Aktiengesellschaft: *See—*
Pavlovsky, Rudolf, 4,222,692, Cl. 409-141.000.

Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,222,532, Cl. 242-55.200.

Geppert, Steven, to Eaton Corporation. Crane operating aid and sensor arrangement therefor. 4,222,491, Cl. 212-153.000.

Gerni A/S: *See—*
Nielsen, Gert, 4,222,521, Cl. 239-135.000.

Gershon Meckler Associates, P.C.: *See—*
Meckler, Gershon, 4,222,244, Cl. 62-2.000.

Gerstmann, Joseph: *See—*
Pompei, Francesco; and Gerstmann, Joseph, 4,222,350, Cl. 122-32.000.

Gesellschaft fur Strahler- und Umweltforschung mbH, Muunchen: *See—*
Uerpmann, Ernst-Peter, 4,222,889, Cl. 252-301.10R.

Giaccaglia, Nello. Plastic shoe sole for sandals and the like. 4,222,185, Cl. 36-30.00R.

Giessner, Frank: *See—*
Bader, Leonhard; Giessner, Frank; and Weber, Helmut, 4,223,323, Cl. 346-140.00R.

Giffin, Brian. Centering and holding devices for potter's wheelhead. 4,222,577, Cl. 279-114.000.

Gilmer, John L.; and Rizzo, Joseph F., to Bell Telephone Laboratories, Incorporated. Minimum break/make pulse corrector. 4,223,184, Cl. 179-16.0EA.

Gilmore, Oscar P. Static mixer. 4,222,671, Cl. 366-337.000.

Gitlitz, Melvin H., to M&T Chemicals Inc. Method for preparing triorganotin halide. 4,222,950, Cl. 260-429.700.

Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., to Owens-Corning Fiberglas Corporation. Method for manufacturing glass fibers. 4,222,757, Cl. 65-2.000.

Glover, Douglas W.: *See—*
Hollyday, Robert D.; and Glover, Douglas W., 4,222,626, Cl. 339-147.00R.

Glowacki, Pierre A.: *See—*
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,222,706, Cl. 415-116.000.

Goi, Yoshihiro; and Kamiharako, Shozo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Driving device for a motor car seat belt. 4,222,587, Cl. 280-804.000.

Gold Kist, Inc.: *See—*
Curtis, Joel E.; and Hall, Thornton D., 4,222,317, Cl. 98-56.000.

Gold, Marvin H. High voltage cable splicing-condensation reaction. 4,222,801, Cl. 156-49.000.

Golden West Homes: *See—*
Latimer, Robert C.; and Pomeroy, Gary W., 4,222,207, Cl. 52-169.300.

Goldman, Gary S.; and Beishline, Allen W. Electric wheel. 4,223,255, Cl. 318-138.000.

Gollifer, MacArthur J.: *See—*
Hounsfield, Godfrey N.; and Gollifer, MacArthur J., 4,223,384, Cl. 364-414.000.

Gonzalez-Dorner, Alberto C.: *See—*
Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., 4,223,095, Cl. 521-55.000.

Good, Mary E., executrix: *See—*
Good, Robert D., deceased; and Quenin, Paul P., 4,222,851, Cl. 208-45.000.

Good, Robert D., deceased (by Good, Mary E., executrix); and Quenin, Paul P., to Dravo Corporation. Recovery of asphalt shingle components by solvent extraction. 4,222,851, Cl. 208-45.000.

Goodner, Willis R.; and Kao, Joseph P. Y., to Motorola, Inc. Workpiece holder and method for plasma reactor apparatus. 4,222,839, Cl. 204-192.00E.

Goody, Roy W. Device for aiding in the selection of a balanced diet. 4,222,179, Cl. 35-1.000.

Goodyear Tire & Rubber Company, The: *See—*
Broughton, Roy M.; Thomas, Joseph R.; and Winters, Terence E., 4,223,124, Cl. 528-272.000.
Chung, Daniel A.; and Lawrence, John P., 4,222,955, Cl. 260-465.00E.
Keck, Max H., 4,223,126, Cl. 528-305.000.

Gorbunov, Boris N.; Khardin, Alexandr P.; Valdman, Alexandr I.; Rykov, Vyacheslav K.; and Sukhanov, Stanislav V. Method of producing acrolein. 4,222,965, Cl. 568-461.000.

Goto, Kazuo: *See—*
Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, 4,222,802, Cl. 156-53.000.

Gotz, Hans; Hack, Albert; and Winz, Hans, to Daimler-Benz Aktiengesellschaft. Passenger space ventilation system for motor vehicles. 4,222,314, Cl. 98-2.180.

Gotz, Hans: *See—*
Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, 4,222,603, Cl. 296-146.000.

Goudsche Machinefabriek B.V.: *See—*
van der Schoot, Peter W. C., 4,222,322, Cl. 99-467.000.

Gould Inc.: *See—*
Stiner, Kent P., 4,223,288, Cl. 335-20.000.

Gould, Rowan W.: *See—*
Garrison, Robert L.; Gould, Rowan W.; O'Leary, Patrick J.; and Fryer, John L., 4,223,014, Cl. 424-92.000.

Grams, Harold: *See—*
Karayannis, Nicholas M.; and Grams, Harold, 4,222,893, Cl. 252-429.00B.

Granda, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.

Gray, David A.; Sivertsen, Marvin L.; Adam, Jerome H.; and Prendergast, John F., Sr., to General Electric Company. Suspended arm for a scintillation camera. 4,223,222, Cl. 250-363.00S.

Gray, Patrick M. Simulated radar game. 4,222,570, Cl. 273-237.000.

Green, William; Heisler, Sidney; and Riazanow, Jay, to Oxydental Products, Inc. Apparatus for controllably dispensing a viscous resin and reactive hardener. 4,222,416, Cl. 141-27.000.

Greenall, Antony; Price, Raymond; and Quan, Peter M., to Imperial Chemical Industries Limited. Process for the manufacture of aromatic nitriles. 4,222,935, Cl. 260-205.000.

Greenaway, David L.: *See—*
Nyfeler, Alex; and Greenaway, David L., 4,223,050, Cl. 427-163.000.

Greenberg, Mishel; Kearney, Michael; and Chernack, Milton P. Disposable thermometer. 4,222,268, Cl. 73-371.000.

Greenleaf, Robert G., to Scientific Tools, Inc. Laboratory tool. 4,222,985, Cl. 422-99.000.

Greenlee, Lois J.; and Greenlee, Lyman R. Device for storing and dispensing tissues, towels, and the like that are provided in the form of rolls. 4,222,621, Cl. 312-37.000.

Greenlee, Lyman R.: *See—*
Greenlee, Lois J.; and Greenlee, Lyman R., 4,222,621, Cl. 312-37.000.

Gregory, George K. E., to John Wyeth & Brother Limited. Slow release pharmaceutical compositions containing 3-[2-(4-benzamido-1-piperidyl)ethyl]indole, embonate. 4,223,008, Cl. 424-32.000.

Gresch, Heinz: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,222,993, Cl. 423-243.000.

Gretag Aktiengesellschaft: *See—*
Wahli, Robert; and Pinkert, Jurgen, 4,222,661, Cl. 355-38.000.

Greubel, Waldemar: *See—*
Baur, Guenter; Greubel, Waldemar; Knauer, Rudolf; and Krueger, Hans, 4,222,880, Cl. 455-617.000.

Griffin, Wendell L.; and Benasutti, John E., to GTE Products Corporation. Electrical connector for circuit board. 4,222,622, Cl. 339-17.0CF.

Griffith, James R.: *See—*
Keller, Teddy M.; and Griffith, James R., 4,223,123, Cl. 528-210.000.

Grigoriev, Ivan N.: *See—*
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.

Grill, James R.: *See—*
Hoaglin, Harold B.; Grill, James R.; and Keller, Jack H., 4,222,795, Cl. 148-9.600.

Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate. Apparatus for conserving energy in electrical appliances. 4,223,301, Cl. 340-500.000.

Grindahl, Robert B., to General Motors Corporation. High stress nodular iron gears and method of making same. 4,222,793, Cl. 148-2.000.

Grosse, Joachim: *See—*
Hassler, Heinrich; Grosse, Joachim; Fischer, Gert; and Hannich, Joachim, 4,222,167, Cl. 29-875.000.

Grossi, Brian J.: *See—*
Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., 4,222,675, Cl. 400-474.000.

Grotto, LaVon P. Air filter arrangement to permit cleaning without removing element. 4,222,755, Cl. 55-291.000.

Grychtol, Klaus: *See—*
Kast, Hellmut; Grychtol, Klaus; and Feichtmayr, Franz, 4,223,144, Cl. 544-392.000.

GTE Laboratories Incorporated: *See—*
Kramer, Jerry M.; and Haugsjaa, Paul O., 4,223,250, Cl. 315-248.000.

GTE Products Corporation: *See—*
Griffin, Wendell L.; and Benasutti, John E., 4,222,622, Cl. 339-17.0CF.

Gubitose, Nicholas F.; Schuler, Malcolm R.; Ronan, Harold R., Jr.; and Novak, Richard E., to RCA Corporation. Meter and dispensing system for abrasive materials. 4,222,502, Cl. 222-240.000.

Guillaume, Francois: *See—*
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,222,516, Cl. 235-492.000.

Guilloty, Haydee R., to Procter & Gamble Company, The. Process for making ethoxylated fatty alcohols with narrow polyethoxy chain distribution. 4,223,163, Cl. 568-618.000.

Guins, Sergei G. Adjustable fluid actuated horizontal bulkhead. 4,222,696, Cl. 410-128.000.

Gulette, Ronald S.: *See—*
White, James E.; Gulette, Ronald S.; and Wheeler, Walter M., 4,222,601, Cl. 296-37.160.

Gulf Oil Corporation: *See—*
Carr, Norman L.; and Schmid, Bruce K., 4,222,847, Cl. 208-8.0LE.
Carr, Norman L.; and Schmid, Bruce K., 4,222,848, Cl. 208-8.0LE.
Schmid, Bruce K., 4,222,845, Cl. 208-8.0LE.
Schmid, Bruce K., 4,222,846, Cl. 208-8.0LE.

Gulf Research & Development Company: *See—*
Innes, Robert A.; and Kehl, William L., 4,222,899, Cl. 252-469.000.
Matthews, Charles W., 4,222,850, Cl. 208-11.00R.
Pellegrini, John P., Jr., 4,222,962, Cl. 260-571.000.
Sabourin, Edward T.; and Selwitz, Charles M., 4,223,172, Cl. 568-812.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,222,896, Cl. 252-437.000.

Gulf & Western Corporation: *See—*
Anderson, Verner; Logan, David J.; and Wood, Kenneth O., 4,222,396, Cl. 131-105.000.

Gullichsen, Johan; and Sundman, Frey V., to A. Ahlstroom Osakeyhtio. Method for treatment of lignocellulosic material with chlorine. 4,222,818, Cl. 162-66.000.

Gunderson, Norman R., to American Electronics, Inc. Automatic camera. 4,222,650, Cl. 354-173.000.

Gunti, Rolf, to Masyc AG. Conveying system with a driven reciprocating load-holding device which is guided in a hollow column. 4,222,461, Cl. 187-20.000.

Gupta, Tapan K.: *See—*
Sweetana, Andrew S., Jr.; Gupta, Tapan K.; Kothmann, Richard E.; and Osterhout, Joseph C., 4,223,366, Cl. 361-127.000.

Guy, Thomas L.: *See—*
Allen, Donnie E.; Kilmer, Robert; Guy, Thomas L.; and Fosnow, Wesley C., 4,222,564, Cl. 273-369.000.

Hachimura, Fukuji: *See—*
Kurosawa, Kenzo; and Hachimura, Fukuji, 4,222,195, Cl. 46-202.000.

Hack, Albert: *See—*
Gotz, Hans; Hack, Albert; and Winz, Hans, 4,222,314, Cl. 98-2.180.

Hackett, Gary K., to Union Oil Company of California. Seismic exploration method. 4,223,399, Cl. 367-41.000.

Haddox, Billy J. Athletic shoe. 4,222,183, Cl. 36-114.000.

Hadley, Michael S., to Beecham Group Limited. Aniline derivatives. 4,223,034, Cl. 424-267.000.

Haenni, Roland: *See—*
Zimmermann, Anton; and Haenni, Roland, 4,222,343, Cl. 118-325.000.

Hafen, Brent Q.: *See—*
Allsen, Philip E.; and Hafen, Brent Q., 4,223,211, Cl. 235-92.0DN.

Haferl, Peter E., to RCA Corporation. Deflection circuit with retrace control. 4,223,251, Cl. 315-370.000.

Haganuma, Tomoyuki: *See—*
Abe, Shintaro; and Haganuma, Tomoyuki, 4,223,393, Cl. 364-900.000.

Hagenbach, Robert J.; Forgensi, Rudolph; Volkers, Stewart W.; and Di Orazio, Dennis F., to Xerox Corporation. Semi-conductive nickel carrier particles. 4,223,085, Cl. 430-108.000.

Haggstrom, Sten L.: *See—*
Fossum, Greta K.; and Haggstrom, Sten L., 4,222,819, Cl. 162-76.000.

Hahn, Alice U.; Rider, Richard H.; Scher, Herbert B.; and Hargrove, Garrard L., to Stauffer Chemical Company. Impregnated porous granules with slow release pore membranes and process therefor. 4,223,070, Cl. 428-407.000.

Hahn, Hans-Dieter: *See—*
Bexten, Ludger; Cornils, Boy; Hahn, Hans-Dieter; and Tummes, Hans, 4,222,966, Cl. 568-451.000.

Haines, Charles, Jr.: *See*—
Kent, Raymond C.; and Haines, Charles, Jr., 4,222,803, Cl. 156-85.000.

Halasa, Adel F.: *See*—
Hergenrother, William L.; and Halasa, Adel F., 4,223,102, Cl. 528-168.000.

Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., to Olin Corporation. Ski manufacturing process. 4,222,808, Cl. 156-245.000.

Halek, George W.; Freed, William T.; Schaul, Jerome S.; Rupp, Raymond W.; and Pauls, Stanley L., to Celanese Corporation. Process for preparing polyethylene terephthalate useful for beverage containers. 4,223,128, Cl. 528-481.000.

Haley, Frank P., to FMC Corporation. Mechanism for clamping plates. 4,222,591, Cl. 285-18.000.

Hall, John B.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.

Hall, John W., to United States of America, Navy. Shaft and bore misalignment measurement tool. 4,222,173, Cl. 33-180.00R.

Hall, Thornton D.: *See*—
Curtis, Joel E.; and Hall, Thornton D., 4,222,317, Cl. 98-56.000.

Hallerman, Edith O. Exerciser and rehabilitative gripping device. 4,222,560, Cl. 272-68.000.

Halstead, Christopher, to Main Gas Appliances Limited. Gas burner. 4,222,526, Cl. 239-556.000.

Hamburger Stahlwerke GmbH: *See*—
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased, 4,222,257, Cl. 72-201.000.

Hamilton, C. Howard; Mahoney, Murray W.; and Paton, Neil E., to Rockwell International Corporation. Method of imparting a fine grain structure to aluminum alloys having precipitating constituents. 4,222,797, Cl. 148-12.70A.

Hamilton, Harold L. Method of well fluid leak prevention. 4,222,444, Cl. 175-72.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,222,327, Cl. 101-288.000.

Hammer, Joseph P. Exercising device. 4,222,559, Cl. 272-63.000.

Hammett, Roy; and Capra, Nicholas G., to James D. Pauls and J. Claybrook Lewis and Associates, Limited. Dual chamber, continuous action dispenser. 4,222,501, Cl. 222-207.000.

Hammett, Roy: *See*—
Capra, Nicholas G.; and Hammett, Roy, 4,222,500, Cl. 222-207.000.

Hammond, George B.: *See*—
McCray, Philip C.; and Hammond, George B., 4,222,418, Cl. 144-2.00Z.

Hanaoka, Seiji: *See*—
Mori, Masahiko; Hanaoka, Seiji; and Kobayashi, Takao, 4,222,674, Cl. 400-124.000.

Hannah, James T. Electronic control device for decisions and scoring. 4,223,383, Cl. 364-411.000.

Hannich, Joachim: *See*—
Hassler, Heinrich; Grosse, Joachim; Fischer, Gert; and Hannich, Joachim, 4,222,167, Cl. 29-875.000.

Hannigan, Joseph F., to United States of America, Army. Method and apparatus for camouflage signature measurement. 4,223,345, Cl. 358-93.000.

Hansel, John H.; Linton, Robert G.; and Stanger, Charles W., Jr., to Air Products and Chemicals, Inc. Method for promoting regeneration of a catalyst in a fluidized regenerator. 4,222,856, Cl. 208-120.000.

Hansen, Charles M., Jr.; and Wohlberg, Alfred W., to Bendix Corporation, The. Combination exciter/permanent magnet generator for brushless generator system. 4,223,263, Cl. 322-47.000.

Hansen, Lowell D.: *See*—
Huber, Melvin F.; and Hansen, Lowell D., 4,222,712, Cl. 417-204.000.

Hansson, Hans. Raking equipment for trashracks. 4,222,878, Cl. 210-413.000.

Hanstein, Friedrich; and Moench, Theodor P., to Rohm GmbH. Conversion muntins for glazing frames. 4,222,210, Cl. 52-461.000.

Hao, Yu L., to American National Red Cross. Preparation of albumin using ethanol. 4,222,934, Cl. 260-122.000.

Hara, Kunio: *See*—
Yoshida, Kosaku; and Hara, Kunio, 4,222,304, Cl. 85-71.000.

Haraguchi, Yoshifumi: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.

Haraikawa, Tetsuo; and Tamura, Koichi, to Tokico Ltd. Disc brake friction pad retaining structure. 4,222,465, Cl. 188-73.500.

Harato, Takuo: *See*—
Yamada, Koichi; Harato, Takuo; and Shiozaki, Yasumi, 4,222,992, Cl. 423-242.000.

Hard af Segerstad, Carl G. Transmission mechanism. 4,222,279, Cl. 74-100.00R.

Hard, Thomas; and Swingle, Ronald, to Atlantic Cement Company, Inc. Protective scaffold. 4,222,459, Cl. 182-152.000.

Hareng, Michel: *See*—
Assouline, Georges; Hareng, Michel; and Leiba, Eugene, 4,222,636, Cl. 350-350.00R.

Hargrove, Garrard L.: *See*—
Hahn, Alice U.; Rider, Richard H.; Scher, Herbert B.; and Hargrove, Garrard L., 4,223,070, Cl. 428-407.000.

Harrell, Robert E.; and Harrell, Tedd L., to Western Litho Plate & Supply Co. Apparatus and method for processing exposed lithographic plates. 4,222,656, Cl. 354-317.000.

Harrell, Tedd L.: *See*—
Harrell, Robert E.; and Harrell, Tedd L., 4,222,656, Cl. 354-317.000.

Harrigan, William C., Jr.; Flowers, Robert H.; and Hudson, Silas P., to Aerospace Corporation, The. Graphite fiber, metal matrix composite. 4,223,075, Cl. 428-610.000.

Harris Corporation: *See*—
Gasner, John T.; and Rivoli, Anthony L., 4,223,334, Cl. 357-42.000.
Rozell, James O.; and Abmayr, David W., 4,223,381, Cl. 364-200.000.
Taylor, David L.; and Harris, Stephen A., 4,223,277, Cl. 330-264.000.

Harris, Len A.: *See*—
Baney, Ronald H.; and Harris, Len A., 4,223,072, Cl. 428-412.000.

Harris, Stephen A.: *See*—
Taylor, David L.; and Harris, Stephen A., 4,223,277, Cl. 330-264.000.

Harris, Williams R., III: *See*—
Jacobson, Hubert B., 4,222,192, Cl. 43-22.000.

Hartkopf, Edgar: *See*—
Flockenhaus, Claus; and Hartkopf, Edgar, 4,222,824, Cl. 201-41.000.

Hartman, John M.; and Leach, George S., to EMM Semi, Inc. Two-phase continuous poly silicon gate CCD. 4,222,165, Cl. 29-579.000.

Hartmann, Karl D., to Siemens Aktiengesellschaft. Circuit arrangement for line-supplied subscriber stations having dial devices. 4,223,186, Cl. 179-90.00K.

Hartmann, Werther: *See*—
Redlich, Horst; Hartmann, Werther; and Dickopp, Gerhard, 4,223,242, Cl. 310-316.000.

Harvey, Peter: *See*—
Crew, Eric W.; Harvey, Peter; and Fry, Andrew R., 4,223,175, Cl. 174-15.00R.

Hasebee, Kazunori: *See*—
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.

Hasegawa, Yutaka: *See*—
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.

Hashimoto, Takeji; Nagao, Yoshio; and Doi, Yasushi, to Dainippon Screen Seizo Kabushiki Kaisha. Needle selection mechanism for an automatic knitting machine. 4,222,247, Cl. 66-75.200.

Hass, Robert H., to Union Oil Company of California. Process for removing SO_x and NO_x compounds from gas streams. 4,222,991, Cl. 423-235.000.

Hassler, Heinrich; Grosse, Joachim; Fischer, Gert; and Hannich, Joachim, to Siemens Aktiengesellschaft. Method of manufacturing a contact bridge. 4,222,167, Cl. 29-875.000.

Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,222,659, Cl. 355-14.00R.

Hattori, Takeshi; and Hirade, Kenkichi, to Nippon Telegraph and Telephone Public Corporation. Multitransmitter digital signaling system. 4,223,405, Cl. 455-105.000.

Haugsjaa, Paul O.: *See*—
Kramer, Jerry M.; and Haugsjaa, Paul O., 4,223,250, Cl. 315-248.000.

Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J. Method and apparatus for gaging and joining pipe. 4,222,174, Cl. 33-199.00R.

Hauk, Thomas D.: *See*—
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,222,174, Cl. 33-199.00R.

Hawkins, Ronald G., to Aluminum Company of America. Damping spacer with hub interlock and method of making. 4,223,176, Cl. 174-42.000.

Haworth Mfg., Inc.: *See*—
Wilson, Harold R.; and Ten Elshof, Ronald D., 4,222,542, Cl. 248-243.000.

Hayashi, Toshihito: *See*—
Adachi, Ryoichi; and Hayashi, Toshihito, 4,222,727, Cl. 425-222.000.

Hayashi, Yoshimasa: *See*—
Abe, Fumiyuki; and Hayashi, Yoshimasa, 4,222,353, Cl. 123-41.120.

Hazama, Katashi; Yamada, Jun; and Noro, Yoshihiko, to Hitachi, Ltd. Elastic surface wave filter. 4,223,285, Cl. 333-194.000.

Hazan, Isidor, to Du Pont de Nemours, E. I., and Company. Electrodeposition process with ultrafiltration. 4,222,837, Cl. 204-181.00C.

Hazelton, Ronald L.: *See*—
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., 4,222,986, Cl. 422-131.000.

Heath, George F. Solar energy collector. 4,222,371, Cl. 126-440.000.

Hechtl, Wolfgang: *See*—
August, Peter; Hechtl, Wolfgang; and Schmidlkofer, Richard, 4,222,983, Cl. 264-220.000.

Hederich, Volker; Kruckenberg, Winfried; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Anthrachinone dyestuffs. 4,222,947, Cl. 260-380.000.

Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,223,171, Cl. 568-726.000.

Hedrick, Ross M.; and Gabbert, James D., to Monsanto Company. Lactam-polyol-polyacyl lactam terpolymers. 4,223,112, Cl. 525-432.000.

Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Shirakawa, Hideki, to University Patents, Inc. P-Type electrically conducting doped polyacetylene film and method of preparing same. 4,222,903, Cl. 252-518.000.

Heeks, John S., to International Standard Electric Corporation. Electric optic switch. 4,222,637, Cl. 350-356.000.

Heeres, Cornelis J.: *See*—
Larsen, Charles H.; and Heeres, Cornelis J., 4,222,341, Cl. 114-264.000.

Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica N.V. 1-(1,3-Dioxolan-2-ylmethyl)-1H-1,2,4-triazoles. 4,223,036, Cl. 424-269.000.

Heftler, Thomas E.; and Weinroth, Lois L. Paddle for playing platform tennis, paddle ball and the like. 4,222,563, Cl. 273-67.00R.

Hegedus, Louis; Oh, Se H.; and Baron, Kenneth, to General Motors Corporation. Method for reducing CO and HC emissions. 4,222,236, Cl. 60-274.000.

Hehl, Karl. Arrangement for interchangeably mounting different injection units on an injection molding machine. 4,222,730, Cl. 425-450.100.

Heinz Holter: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,222,993, Cl. 423-243.000.

Heisler, Sidney: *See*—
Green, William; Heisler, Sidney; and Riazanow, Jay, 4,222,416, Cl. 141-27.000.

Hellberg, Arne, to Hellberg Protection AB. Mounting a face shield at a protective helmet. 4,222,123, Cl. 2-10.000.

Hellberg, Karl-Heinz: *See*—
Boehm, Horst; and Hellberg, Karl-Heinz, 4,222,967, Cl. 260-653.800.

Hellberg Protection AB: *See*—
Hellberg, Arne, 4,222,123, Cl. 2-10.000.

Helmer, Josef; and Pickard, Jurgen, to Daimler-Benz Aktiengesellschaft. Securing device for planet bolts in planetary gear change-speed transmissions. 4,222,290, Cl. 74-801.000.

Henderson, Eugene R. Building material. 4,222,785, Cl. 106-97.000.

Hendricks, Merl J.: *See*—
Gauthier, William D.; Hendricks, Merl J.; and Babcock, Robert L., 4,222,750, Cl. 55-58.000.

Henkel & Cie: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,222,995, Cl. 423-329.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Meins, Peter; and Bruns, Klaus, 4,222,904, Cl. 252-522.00R.

Hennings, Detlev; and Schreinemacher, Herbert, to U.S. Philips Corporation. Method of producing a dielectric with perowskite structure and containing a copper oxide. 4,222,885, Cl. 252-63.200.

Henrick, Clive A., to Zoecon Corporation. Substituted pyridine methyl esters of naphthyl acids. 4,223,033, Cl. 424-263.000.

Henrick, Clive A.: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,223,012, Cl. 424-84.000.

Henry, Rodney D., to Rockwell International Corporation. Ferrimagnetic Faraday elements for ring lasers. 4,222,668, Cl. 356-350.000.

Hentschel, Peter; Zengel, Hans; and Bergfeld, Manfred, to Akzo N.V. Process for the preparation of organic mono- and polyisocyanates. 4,223,145, Cl. 546-107.000.

Hergenrother, P. Richard, to Koppers Company, Inc. Rubberized coal tar pitch emulsion. 4,222,916, Cl. 260-285.0AS.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene poiymers containing substituents derived from alkyl or aryl carbazates. 4,223,102, Cl. 528-168.000.

Hermann Waldner GmbH & Co.: *See*—
Wulf, Gunter, 4,222,413, Cl. 137-637.300.

Hertzberg, Samuel. Vacuum cleaners. 4,222,146, Cl. 15-392.000.

Herzan, Eugene H.; and Johnson, Lyle R., to Parker-Hannifin Corporation. Lever actuated fluid coupling. 4,222,411, Cl. 137-614.040.

Hess, Bernhard: *See*—
Schulz-Walz, Hansjochen; Hess, Bernhard; Beckers, Johannes; and Kloker, Werner, 4,222,927, Cl. 260-40.00R.

Hess, Lawrence G., to Union Carbide Corporation. Reaction of oxirane compounds with carboxylic acids. 4,223,160, Cl. 560-209.000.

Hession, Francis P., to Bell & Howell Company. Curl resistant photoplastic film. 4,223,062, Cl. 428-216.000.

Heymer, Gero: *See*—
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,222,994, Cl. 423-321.00S.

Higgins, Raymond; and Hutchings, Graham J., to Imperial Chemical Industries Limited. Production of maleic anhydride. 4,222,945, Cl. 260-346.750.

Hijikata, Toshio; Yamazaki, Takao; and Fujita, Kiyohiko, to Neturen Company, Ltd. High-strength spring steel and its manufacturing process. 4,222,799, Cl. 148-143.000.

Hildebrand, Donald L.: *See*—
Kieft, Gerald N.; and Hildebrand, Donald L., 4,222,141, Cl. 15-84.000.

Hildebrandt, Bodo, to Wella Aktiengesellschaft. Arrangement for spraying liquid from a bottle. 4,222,525, Cl. 239-343.000.

Hildenbrand, Walter W.: *See*—
Bogardus, E. Hal; Hildenbrand, Walter W.; and Levanoni, Menachem, 4,223,318, Cl. 346-1.100.

Hill, John A., III: *See*—
Kasper, Klaus B.; and Hill, John A., III, 4,222,973, Cl. 264-22.000.

Hill, Richard N., to W. R. Grace & Co. Settling clarifier. 4,222,879, Cl. 210-520.000.

Hillebrand, George W.: *See*—
Murphy, Michael P.; and Hillebrand, George W., 4,222,840, Cl. 204-195.00S.

Hilti Aktiengesellschaft: *See*—
Chromy, Franz, 4,222,443, Cl. 173-116.000.

Hinchcliffe, Dennis: *See*—
Molins, Desmond W.; and Hinchcliffe, Dennis, 4,222,477, Cl. 198-347.000.

Hirade, Kenkichi: *See*—
Hattori, Takeshi; and Hirade, Kenkichi, 4,223,405, Cl. 455-105.000.

Hirai, Shoichi: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.

Hiranishi, Michiko. Quilted clothing with reinforced seam. 4,222,124, Cl. 2-93.000.

Hirayama, Kazuhiro: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.

Hirdler, Louis C.; and Smialek, Raymond J., to Olin Corporation. Solvent recovery from gaseous mixtures produced in the manufacture of cyanuric acid. 4,223,140, Cl. 544-192.000.

Hishinuma, Masakatsu: *See*—
Miyatake, Osamu; Murakami, Hirotake; and Hishinuma, Masakatsu, 4,222,226, Cl. 368-113.000.

Hiskens, Ian R.; Johnson, David C.; and Caudwell, Michael J., to Tenneco Chemicals, Inc. Paper sizing agents. 4,222,820, Cl. 162-158.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.

Hitachi, Ltd.: *See*—
Amada, Eiichi; and Ohnishi, Makoto, 4,223,389, Cl. 364-724.000.
Hazama, Katashi; Yamada, Jun; and Noro, Yoshihiko, 4,223,285, Cl. 333-194.000.
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yositeru; and Kuniya, Jiro, 4,223,197, Cl. 219-61.700.
Iyotani, Ryuji; and Watanabe, Atsumi, 4,223,236, Cl. 307-252.00Q.
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.
Misumi, Akira; and Kumada, Masaharu, 4,222,775, Cl. 75-170.000.
Morikawa, Juichi; and Kotera, Nobuo, 4,223,292, Cl. 338-32.00H.
Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, 4,222,802, Cl. 156-53.000.
Takahashi, Fuminobu; Kanamori, Takahiro; and Suzuki, Kazumichi, 4,222,273, Cl. 73-603.000.
Terasawa, Yoshio; Miyata, Kenji; Naito, Masayoshi; Ogawa, Takuzo; and Okamura, Masahiro, 4,223,328, Cl. 357-22.000.
Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, 4,223,187, Cl. 179-100.10G.

Hitachi Maxell, Ltd.: *See*—
Zaitsu, Hiroshi; Yamase, Takashi; Yamashita, Sadao; and Mizushima, Kunio, 4,223,361, Cl. 360-133.000.

Hoaglin, Harold B.; Grill, James R.; and Keller, Jack H., to Chicago Bridge & Iron Company. Pipe cutting apparatus and method. 4,222,795, Cl. 148-9.600.

Hochiki Corporation: *See*—
Arima, Takeo, 4,223,305, Cl. 340-629.000.

Hock, Fromund, to Hock, Fromund. Optical arrangement for geometrically separating the light fluxes in imaging systems. 4,222,633, Cl. 350-162.00R.

Hocking, Guy E., to Marvel Engineering Company. Conditions monitoring device. 4,223,302, Cl. 340-525.000.

Hocks, Robert W.; and Vernon, Jack A., to American Tinnitus Association. Tinnitus masker. 4,222,393, Cl. 128-746.000.

Hoechst Aktiengesellschaft: *See*—
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,222,994, Cl. 423-321.00S.
Johannes, Gerhard; and Hotze, Hermann, 4,223,097, Cl. 525-107.000.
Wiezer, Hartmut, 4,223,148, Cl. 546-242.000.

Hoefer, William G.: *See*—
Noble, Milton L.; Craig, Samuel E.; and Hoefer, William G., 4,223,354, Cl. 358-233.000.

Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,223,142, Cl. 544-236.000.

Hoesch Werke Aktiengesellschaft: *See*—
Pappert, Werner; Tenhaven, Ulrich; and Wolff, Friedrich, 4,223,047, Cl. 427-32.000.

Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Fuel injection system. 4,222,358, Cl. 123-495.000.

Hofer, Wolfgang O.; Kirschner, Jurgen; and Thum, Franz, to Max-Planck-Gesellschaft zur Foerderung der Wissenschafter e.V. Broad-range ion mass spectrometer. 4,223,223, Cl. 250-397.000.

Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Schmidt, Robert A., 4,222,944, Cl. 260-346.710.
Newman, Edward S., 4,223,002, Cl. 424-1.000.
Olson, Gary L., 4,222,943, Cl. 260-345.80R.

Holbek, Gert A. E. Door hinge arrangement permitting opening of the door alternatively at either side. 4,222,149, Cl. 16-147.000.

Holdt, Donald H.; and Sims, James S., Jr., to Chemed Corporation. Hook type fowler for hospital stretchers. 4,222,131, Cl. 5-79.000.

Hollingsworth, Frank H.; and Mower, Lawrence N., to Standard Oil Company (Indiana). Reservoir fluid sampling method and apparatus. 4,222,438, Cl. 166-250.000.

Hollyday, Robert D.; and Glover, Douglas W., to AMP Incorporated. Filtered dip header assembly. 4,222,626, Cl. 339-147.00R.

Holter, Hans-Joachim: *See—*
Wolff, Friedrich; Holter, Hans-Joachim; and Krumrey, Hans-Peter, 4,222,203, Cl. 51-3.000.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Heinz Holter. Removal of noxious contaminants from gas. 4,222,993, Cl. 423-243.000.

Holzinger, Gerhard: *See—*
Frosch, Albert; Holzinger, Gerhard; Jaerisch, Walter; and Scheuing, Claus, 4,222,669, Cl. 356-360.000.

Honel, Hans; Keller, Karlfried; Michel, Walter; and Schon, Manfred, to Cassella Aktiengesellschaft. Preparation of methoxy-methyl melamines. 4,223,141, Cl. 544-196.000.

Honkaniemi, Matti E.: *See—*
Tuovinen, Frans H.; Honkaniemi, Matti E.; Virta, Matias A.; and Krogerus, Helge J., 4,222,786, Cl. 106-117.000.

Honma, Toshio: *See—*
Furuichi, Katsushi; Honma, Toshio; and Murakami, Katsumi, 4,222,660, Cl. 355-14.00R.

Hoover, Bradley R.: *See—*
Neiheisel, Gary L.; and Hoover, Bradley R., 4,223,346, Cl. 358-106.000.

Hoover Universal, Inc.: *See—*
Mizelle, Ned W., 4,222,135, Cl. 5-310.000.

Hope Co., Ltd.: *See—*
Kikuchi, Toshikazu, 4,222,584, Cl. 280-626.000.

Horn, William F.: *See—*
Springer, Jerry L.; Wells, Charles M.; and Horn, William F., 4,223,293, Cl. 338-34.000.

Hornaman, Ernest C.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,223,115, Cl. 525-455.000.

Horner, Gerhard; and Kohler, Kurt, to Bergemann GmbH. Blowing apparatus for removing soot. 4,222,144, Cl. 15-317.000.

Horton, Anthony; McKeon, Thomas M.; and Preston, Jack, to Laporte Industries Limited. Method and apparatus for electrically heating corrosive vapors. 4,223,206, Cl. 219-374.000.

Horvat, Ivan J. High efficiency filter for textile waste. 4,222,754, Cl. 55-283.000.

Horwitz, Norman H., to William Beaumont Hospital. Laser alignment fixture. 4,223,227, Cl. 250-491.000.

Hosbein, Hugh W., to Mossberg Hubbard, Division of Wanskuck Company. Wire dereeling apparatus. 4,222,535, Cl. 242-128.000.

Hoshi, Yoshiyuki: *See—*
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.

Hosogai, Takeo: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.

Hosoi, Ryosuke. Drill having cutting edges with the greatest curvature at the central portion thereof. 4,222,690, Cl. 408-230.000.

Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, to Sony Corporation. Beam index color cathode ray tube. 4,223,344, Cl. 358-67.000.

Hotze, Hermann: *See—*
Johannes, Gerhard; and Hotze, Hermann, 4,223,097, Cl. 525-107.000.

Hounsfield, Godfrey N.; and Gollifer, MacArthur J., to EMI Limited. Radiography. 4,223,384, Cl. 364-414.000.

Howe, Philip M., to United States of America, Army. Antipropagation explosive packaging means. 4,222,484, Cl. 206-3.000.

Howe, Robert K.: *See—*
Liu, Kou-Chang; and Howe, Robert K., 4,223,154, Cl. 548-248.000.

Hrivnak, Bonnie J.: *See—*
Bacon, Duane E.; Gattermeir, J. David; and Hrivnak, Bonnie J., 4,222,834, Cl. 204-129.600.

Hruza, Denis E., Sr.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.

Hsia, Jen C.; Le Blanc, Arthur E.; and Marshman, Joan A., to University of Toronto, The Governing Council of the. Drug compositions. 4,223,004, Cl. 424-9.000.

Hsieh, Henry L.: *See—*
Moczygemba, George A.; and Hsieh, Henry L., 4,223,116, Cl. 526-117.000.

Hsu, Yung-San. Clutch and brake arrangements for a motor. 4,222,471, Cl. 192-18.00B.

Hu, Mae W.; and Singh, Prithipal, to Syva Company. Amitriptyline conjugates to antigenic proteins and enzymes. 4,223,013, Cl. 424-85.000.

Huang, Kwang T.: *See—*
Paszyc, Aleksy J.; Huang, Kwang T.; and Shiroma, Dallas M., 4,223,241, Cl. 310-308.000.

Huber, Kurt: *See—*
Jaeger, Roland; and Huber, Kurt, 4,223,166, Cl. 568-779.000.

Huber, Melvin F.; and Hansen, Lowell D., to Sundstrand Corporation. Multiple displacement pump system with bypass controlled by inlet pressure. 4,222,712, Cl. 417-204.000.

Hubred, Gale L.; and Owen, Edwin L., to Kennecott Copper Corporation. Cascading electrolyte bleed streams. 4,222,832, Cl. 204-106.000.

Huck, David N. Display device. 4,222,187, Cl. 40-16.000.

Hudson, Silas P.: *See—*
Harrigan, William C., Jr.; Flowers, Robert H.; and Hudson, Silas P., 4,223,075, Cl. 428-610.000.

Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., to Minnesota Mining and Manufacturing Company. Semiconductive and sensitized photoconductive compositions. 4,222,902, Cl. 252-500.000.

Hultberg, Tore. Glow-lamp holder. 4,222,623, Cl. 339-34.000.

Human, Douglas. Caravan or campervan construction. 4,222,604, Cl. 296-165.000.

Humber, Leslie G.: *See—*
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,223,151, Cl. 546-269.000.

Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., to Lever Brothers Company. Manufacture of marbled detergent bars. 4,222,979, Cl. 264-75.000.

Huret, Roger H. M. Hand lever control for bicycle derailleur gears. 4,222,286, Cl. 74-501.00R.

Hurni, Samuel, to Gebrueder Buehler AG. Rotary tubular kiln and satellite cooler therefor with improved support means. 4,222,736, Cl. 432-80.000.

Hutchings, Graham J.: *See—*
Higgins, Raymond; and Hutchings, Graham J., 4,222,945, Cl. 260-346.750.

Hutter, Hans-Georg. Clamping devices. 4,222,489, Cl. 211-45.000.

I. W. Industries, Inc.: *See—*
Warshawsky, Jerome, 4,223,051, Cl. 428-28.000.

Ideal Toy Corporation: *See—*
Tinguely, James; and Snyder, Edward, III, 4,222,558, Cl. 272-31.00A.

Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,222,993, Cl. 423-243.000.

Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I. Method for preparing heterochain polymers. 4,223,105, Cl. 528-179.000.

Iida, Toshihide: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,222,659, Cl. 355-14.00R.

Ikeda, Masaki, to Tomy Kogyo Co., Inc. Apparatus for projecting a light beam. 4,223,376, Cl. 362-112.000.

Ikeda, Toshihide; Kobayashi, Toshiaki; Nakano, Motokiyo; and Tanaka, Chiaki, to Shiseido Co., Ltd. Thixotropic nail enamel. 4,222,908, Cl. 260-16.000.

Ikegawa, Hideaki: *See—*
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,223,327, Cl. 357-15.000.

Illger, Hans W.: *See—*
Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., 4,223,095, Cl. 521-55.000.

Illinois Railway Equipment Company: *See—*
Jensen, Finn; and Sweger, Theodore J., 4,222,538, Cl. 248-56.000.

Imada, Yukio; and Takahashi, Katsuhiko, to Mitsubishi Chemical Industries Limited. Process for producing steroidal alcohols. 4,223,091, Cl. 435-55.000.

Imai, Katsuyuki; Masaoka, Isao; Chiba, Yositeru; and Kuniya, Jiro, to Hitachi, Ltd. Method of cooling weld in steel piping and apparatus therefor. 4,223,197, Cl. 219-61.700.

Immel, Ralph B., to Westinghouse Electric Corp. AC-DC Magnet coil assembly for low dropout AC contactors. 4,223,289, Cl. 335-202.000.

Imperial Chemical Industries Limited: *See—*
Greenall, Antony; Price, Raymond; and Quan, Peter M., 4,222,935, Cl. 260-205.000.
Higgins, Raymond; and Hutchings, Graham J., 4,222,945, Cl. 260-346.750.

Imura, Toshinori; and Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Camera shutter release device. 4,222,645, Cl. 354-51.000.

Inca-One Corporation: *See—*
Roberts, George C., 4,222,130, Cl. 4-321.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Belisomi, Pietro, 4,223,352, Cl. 358-185.000.
Zappala, Giuseppe, 4,223,367, Cl. 361-156.000.

Indianapolis Center for Advanced Research: *See—*
Kaplan, Jerome I., 4,223,228, Cl. 250-491.000.

Industrial Blast Coil Corporation: *See—*
Kerivan, Leo J., 4,222,160, Cl. 29-157.30A.

Ing. C. Olivetti & C., S.p.A.: *See—*
Galvagni, Alighiero, 4,223,359, Cl. 360-99.000.

Ingersoll-Rand Canada Inc.: *See—*
Young, Douglas L. G., 4,222,863, Cl. 209-273.000.

Inmont Corporation: *See—*
Aluotto, Patrick F.; and Drees, Paul A., 4,222,919, Cl. 260-29.40R.
Bryant, Earle R.; Knittel, Gerald H.; and Dircks, Lon E., 4,222,925, Cl. 260-37.00N.

Fine, Jerome; and De Tora, Sigismondo A., 4,223,101, Cl. 528-76.000.
Innes, Robert A.; and Kehl, William L., to Gulf Research & Development Company. Ammoxidation catalyst. 4,222,899, Cl. 252-469.000.
Inoue, Atsushi; Yamada, Hiromichi; and Suzuki, Kenji, to Murata Manufacturing Co., Ltd. Acoustic surface wave device. 4,223,284, Cl. 333-150.000.
Inoue Gomu Kogyo Kabushiki Kaisha: *See*—
Tsuda, Eiichi; and Mizudani, Tomihiko, 4,223,052, Cl. 428-31.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,223,198, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Arm deflection constant traveling-wire EDM method and apparatus. 4,223,198, Cl. 219-69.00W.
Inoue, Norihiro: *See*—
Niwa, Masatake; Inoue, Norihiro; Kawamura, Kunio; and Beppu, Norio, 4,222,649, Cl. 354-173.000.
Inoue, Takemi: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.
Institut Francais du Petrole: *See*—
Cholet, Henri, 4,222,447, Cl. 175-340.000.
Institut Francias du Petrole: *See*—
Delignieres, Robert, 4,222,630, Cl. 350-96.240.
Institut Textile de France: *See*—
Leblanc, Michel; Laneres, Jacques; and Perrin, Jean, 4,222,261, Cl. 73-29.000.
Institute of Applied Biology Special Cancer Research Project: *See*—
Rubens, Harry E., 4,222,389, Cl. 128-633.000.
Intel Corporation: *See*—
Pathak, Saroj; and Perlegos, George, 4,223,394, Cl. 365-210.000.
International Business Machines Corporation: *See*—
Bogardus, E. Hal; Hildenbrand, Walter W.; and Levanoni, Menachem, 4,223,318, Cl. 346-1.100.
Bowers, Earl Q.; and Nelson, David L., 4,223,390, Cl. 364-900.000.
Frosch, Albert; Holzinger, Gerhard; Jaerisch, Walter; and Scheuing, Claus, 4,222,669, Cl. 356-360.000.
Jambotkar, Chakrapani G., 4,223,329, Cl. 357-24.000.
Konheim, Alan G.; and Tuckerman, Louis B., III, 4,223,403, Cl. 375-2.000.
Lever, Reginald F.; Mauer, John L., IV; Michel, Alwin E.; and Rothman, Laura B., 4,222,792, Cl. 148-1.500.
Noble, Wendell P., Jr.; and Unis, Richard A., 4,222,816, Cl. 156-643.000.
Triebwasser, Sol, 4,222,164, Cl. 29-571.000.
International Flavors & Fragrances Inc.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,222,941, Cl. 260-345.100.
International Harvester Company: *See*—
Domes, E. A.; and Vacval, Dusan M., 4,222,463, Cl. 188-72.300.
Fachini, Robert M.; and Lester, William D., 4,222,452, Cl. 180-162.000.
Schillings, Dieter, 4,222,583, Cl. 280-461.00A.
International Standard Electric Corporation: *See*—
Heeks, John S., 4,222,637, Cl. 350-356.000.
Ionescu, Miruleta. Artificial nail. 4,222,399, Cl. 132-73.000.
Irathane Systems Incorporated: *See*—
Valeri, William J.; and Burkes, Daniel O., 4,222,865, Cl. 209-399.000.
Iriguchi, Norio: *See*—
Boretos, John W.; and Iriguchi, Norio, 4,222,126, Cl. 3-1.500.
Irvin Industries Inc.: *See*—
White, James E.; Gulette, Ronald S.; and Wheeler, Walter M., 4,222,601, Cl. 296-37.160.
Isachenko, Mikhail M.: *See*—
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.
Ishida, Takuo, to Shimano Industrial Company, Limited. Fishing reel. 4,222,534, Cl. 242-84.20R.
Ishigaki, Yoshio: *See*—
Tsuchiya, Takao; Okada, Takashi; Ishigaki, Yoshio; and Omori, Shouji, 4,223,342, Cl. 358-37.000.
Ishiguro, Yasuo, to Copal Company Limited. Electric shutter for cameras. 4,222,652, Cl. 354-234.000.
Ishihara, Tatsuo: *See*—
Matsubara, Masaka; Ishihara, Tatsuo; and Mori, Tokitaka, 4,223,015, Cl. 424-95.000.
Ishikawa, Takehito: *See*—
Takayama, Shuichi; Ishikawa, Takehito; Kimura, Ichiro; and Shigematu, Syozi, 4,222,765, Cl. 71-88.000.
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Christiansen, Jorgen B., 4,222,337, Cl. 110-336.000.
Isono, Katsuo: *See*—
Tamaru, Hideshi; Isono, Katsuo; Sanada, Seiji; Yamagiwa, Kazuo; and Yamauchi, Toshiyuki, 4,223,338, Cl. 358-4.000.
ITT Industries, Inc.: *See*—
Quere, Eugene M.; and Le Rolland, Pierre M., 4,223,370, Cl. 361-331.000.
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Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.
Ivanov, Valentin A.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.
Ivanov, Vladimir M.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.
Ivobotenko, Boris A.: *See*—
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.
Iwabuchi, Takeshi: *See*—
Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; and Kawahara, Masao, 4,223,118, Cl. 526-128.000.
Iwako, Akinobu, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Automatic compound pattern generation type sewing machine. 4,222,339, Cl. 112-158.00E.
Iwamoto, Eiji: *See*—
Fujii, Osamu; Takano, Misao; Uotani, Takeshi; and Iwamoto, Eiji, 4,223,152, Cl. 546-273.000.
Iwanaga, Masayuki: *See*—
Nishikawa, Mineki; Kakegawa, Makoto; Iwanaga, Masayuki; and Shouta, Koujirou, 4,223,388, Cl. 364-521.000.
Iwasaki, Sadayoshi; and Miyata, Hiroyasu, to Alps Electric Co., Ltd. Device for representing status of push button switch. 4,223,193, Cl. 200-308.000.
Iyotani, Ryuji; and Watanabe, Atsumi, to Hitachi, Ltd. Gate controlling apparatus for a thyristor valve. 4,223,236, Cl. 307-252.00Q.
I²DS: *See*—
Mayer, Thomas J., 4,222,711, Cl. 417-7.000.
J. Bobst & Fils S.A. Lausanne: *See*—
Jaton, Jean P., 4,222,311, Cl. 93-36.00M.
J. M. Voith GmbH: *See*—
Thumm, Helmut, 4,222,531, Cl. 241-281.000.
Jackson, Clifton E.; and Kinsley, Ronnie L. Hand held disk launcher. 4,222,361, Cl. 124-5.000.
Jackson, Robert T., to Northeastern, Incorporated. Adapter construction for arbor installation of tooling. 4,222,297, Cl. 83-481.000.
Jacobs, Cornelis A. J.; and Rozenboom, Jaap, to U.S. Philips Corporation. Metal vapor discharge lamp. 4,223,247, Cl. 315-57.000.
Jacobs, Stanley C.: *See*—
Dawless, Robert K.; and Jacobs, Stanley C., 4,222,830, Cl. 204-67.000.
Jacobson, Howard W., to Du Pont de Nemours, E. I., and Company. Light-stable titanium dioxide pigment composition. 4,222,789, Cl. 106-300.000.
Jacobson, Hubert B., to Harris, Williams R., III, a part interest. Handle and reel seat for a fishing rod. 4,222,192, Cl. 43-22.000.
Jacobson, Larry A., to Schlumberger Technology Corporation. Methods and apparatus for optimizing measurements of thermal neutron decay characteristics. 4,223,218, Cl. 250-262.000.
Jaeger, Roland; and Huber, Kurt, to Societe Anonyme pour l'Industrie Chimique; and Ciba-Geigy Corporation. Process for producing 4-bromo-2-chlorophenols. 4,223,166, Cl. 568-779.000.
Jaerisch, Walter: *See*—
Frosch, Albert; Holzinger, Gerhard; Jaerisch, Walter; and Scheuing, Claus, 4,222,669, Cl. 356-360.000.
Jaeschke, James R.: *See*—
Bongard, James A.; Duncan, Eugene F.; and Jaeschke, James R., 4,223,217, Cl. 250-227.000.
Jamain, Philippe, to Compagnie Generale des Etablissements Michelin. Pneumatic tire tread. 4,222,423, Cl. 152-209.00R.
Jambotkar, Chakrapani G., to International Business Machines Corporation. Bipolar dual-channel charge-coupled device. 4,223,329, Cl. 357-24.000.
James D. Pauls and J. Claybrook Lewis and Associates, Limited: *See*—
Hammett, Roy; and Capra, Nicholas G., 4,222,501, Cl. 222-207.000.
James D. Pauls, Limited: *See*—
Capra, Nicholas G.; and Hammett, Roy, 4,222,500, Cl. 222-207.000.
James, Kenneth A.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,223,216, Cl. 250-226.000.
Quick, William H.; August, Rudolf R.; James, Kenneth A.; Strahan, Virgil H., Jr.; and Nichols, Donald K., 4,223,226, Cl. 250-458.000.
James, Vaughn F. Cutting tool or the like. 4,222,298, Cl. 83-853.000.
Jamieson, John M.: *See*—
Smith, David L.; and Jamieson, John M., 4,223,212, Cl. 235-92.0MP.

Jansen, Martin B.: *See*—
Saliger, Kenneth C.; and Jansen, Martin B., 4,222,592, Cl. 285-18.000.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,223,036, Cl. 424-269.000.
Japan Atomic Energy Research Institute: *See*—
Motojima, Kenji; Tachikawa, Enzo; and Kamiyama, Hideo, 4,222,892, Cl. 252-428.000.
Japan Fumigation Development Co., Ltd.: *See*—
Se, Tsuneyuki, 4,223,044, Cl. 426-318.000.
Jastrzebski, J. T. B. H.: *See*—
Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, 4,222,898, Cl. 252-447.000.
Jaton, Jean P., to J. Bobst & Fils S.A. Lausanne. Process and system for producing folded boxes. 4,222,311, Cl. 93-36.00M.
Jefferson, Gene; and Laborde, Martin, to Corporation de Fomento de la Produccion; and Corporacion De Fomento De La Produccion. Pond sealing. 4,222,685, Cl. 405-270.000.
Jensen, Finn; and Sweger, Theodore J., to Illinois Railway Equipment Company. Pipe anchor. 4,222,538, Cl. 248-56.000.
Jervis B. Webb Company: *See*—
Dehne, Clarence A.; and Pachuta, Martin, 4,222,481, Cl. 198-684.000.
Jirkovsky, Ivo L.: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,223,151, Cl. 546-269.000.
Jodrey, Robert M., to Dennison Manufacturing Company. Bottle transport system. 4,222,813, Cl. 156-540.000.
Johannes, Gerhard; and Hotze, Hermann, to Hoechst Aktiengesellschaft. Powder binder composition comprising an epoxy resin, a polyester resin and an accelerator. 4,223,097, Cl. 525-107.000.
Johansson, Gunnar; and Kullander, Mats O., to Billeruds Aktiebolag. Apparatus for coating a moving web. 4,222,342, Cl. 118-50.000.
John, Julius F., to Norco Industries, Inc. Unitary oil block. 4,222,548, Cl. 254-8.00B.
John O. Butler Company: *See*—
Tarrson, Emanuel B.; Tisma, Steven; and Staubitz, Robert B., 4,222,143, Cl. 15-105.000.
John Rouzee Green Co., The: *See*—
Shabala, Stephen, 4,222,567, Cl. 273-167.00R.
John Wyeth & Brother Limited: *See*—
Gregory, George K. E., 4,223,008, Cl. 424-32.000.
Johnson, David A.: *See*—
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,223,135, Cl. 544-30.000.
Johnson, David C.: *See*—
Hiskens, Ian R.; Johnson, David C.; and Caudwell, Michael J., 4,222,820, Cl. 162-158.000.
Johnson, George W. S. Garden curbing and method of forming same. 4,222,197, Cl. 47-33.000.
Johnson, James E.; Castells, Onofre T. M.; and Rundell, Dan J., to General Electric Company. Auxiliary lift propulsion system with oversized front fan. 4,222,233, Cl. 60-225.000.
Johnson, Kenneth C., to F. J. Littell Machine Company. Straightener with individually removable roll and pivoted bearing housing and roll design. 4,222,256, Cl. 72-164.000.
Johnson, Lake H.: *See*—
Webster, Donald A.; Johnson, Lake H.; and Romanauskas, William A., 4,222,513, Cl. 233-26.000.
Johnson, Lyle R.: *See*—
Herzan, Eugene H.; and Johnson, Lyle R., 4,222,411, Cl. 137-614.040.
Johnson, Marguerite A.: *See*—
Bakewell, Henry P., Jr.; and Johnson, Marguerite A., 4,223,397, Cl. 367-13.000.
Johnson, Oliver. Detachable cell frozen confection forming and holding apparatus. 4,223,043, Cl. 426-122.000.
Johnson, Sigvold O., to Thermo King Corporation. Reversible unidirectional fluid flow pump. 4,222,719, Cl. 418-32.000.
Johnson, Steven A. Ultrasound imaging apparatus and method. 4,222,274, Cl. 73-607.000.
Johnston, David K.; and Stuber, Michael R., to Allis-Chalmers Corporation. Threshing cage fingers for retarding the flow of material through an axial flow harvester. 4,222,395, Cl. 130-27.00T.
Johnston, James V., to United States of America, Army. Digital fluidic output force balance accelerometer. 4,222,271, Cl. 73-515.000.
Jolley, Michael R. J.: *See*—
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,222,946, Cl. 260-347.300.
Jones, Cyril T. Asphalt mixture. 4,222,787, Cl. 106-281.00R.
Jones, Elmer R. Burn-in trays for semiconductor circuits. 4,222,737, Cl. 432-253.000.
Jones, Jerry R.; and Stephens, Ralph F., to Western Electric Company, Inc. Methods and apparatus for sorting articles. 4,222,488, Cl. 209-583.000.
Jones, John L.: *See*—
Rubino, Andrew M.; Jones, John L.; and Bretschneider, Edward S., 4,223,010, Cl. 424-66.000.
Jones, Newlyn; Stewart, Alistair C.; and Elston, Colin, to C. H. Dexter Limited. Casing paper having alkali resistance. 4,222,821, Cl. 162-164.00R.
Joslyn Mfg. and Supply Co.: *See*—
Lusk, George E.; and Northrup, Stephen D., 4,223,179, Cl. 174-73.00R.
Jouffret, Michel, to Rhone-Poulenc Industries. Process for the hydroxylation of aromatic compounds. 4,223,165, Cl. 568-771.000.
Jubb, Albert, to Rolls-Royce Limited. Solar heat aperture control apparatus. 4,222,367, Cl. 126-419.000.
Jubb, Albert; and Stansbury, Eric W., to Rolls-Royce Limited. Solar radiant energy heat exchanger. 4,222,369, Cl. 126-438.000.
Julke, Elias, to BBC Brown, Boveri & Company, Limited. Method and apparatus for producing liquid crystal displays, and a liquid crystal display produced thereby. 4,222,635, Cl. 350-320.000.
Junes, Norman E. Propeller reconditioner. 4,222,259, Cl. 72-293.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Masui, Yasuyuki, 4,222,228, Cl. 368-291.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Mori, Masahiko; Hanaoka, Seiji; and Kobayashi, Takao, 4,222,674, Cl. 400-124.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,222,710, Cl. 416-236.00A.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See*—
Iwako, Akinobu, 4,222,339, Cl. 112-158.00E.
Kadan, Alvin: *See*—
Kadan, Bertram Z.; Kadan, Seymour; and Kadan, Alvin, 4,222,349, Cl. 122-20.00B.
Kadan, Bertram Z.; Kadan, Seymour; and Kadan, Alvin. Stack exhaust heat recycling system. 4,222,349, Cl. 122-20.00B.
Kadan, Seymour: *See*—
Kadan, Bertram Z.; Kadan, Seymour; and Kadan, Alvin, 4,222,349, Cl. 122-20.00B.
Kagi, Bruno; Kormany, Geza; and Luthi, Christian, to Ciba-Geigy Corporation. Certain bis(phenyl)-benzodifurans. 4,222,739, Cl. 8-648.000.
Kaiho, Keisuke: *See*—
Yoshida, Risaburo; Nagata, Hidetoshi; Naito, Michihisa; and Kaiho, Keisuke, 4,223,074, Cl. 428-469.000.
Kain's Research & Development Company, Inc.: *See*—
Lee, Harold D.; and Carimi, Darryl L., 4,222,499, Cl. 222-183.000.
Kaiser, Russell E., to Litton Industrial Products, Inc. Speed control for a rotary dressing wheel. 4,222,362, Cl. 125-11.0CD.
Kakegawa, Makoto: *See*—
Nishikawa, Mineki; Kakegawa, Makoto; Iwanaga, Masayuki; and Shouta, Koujirou, 4,223,388, Cl. 364-521.000.
Kali-Chemie AG: *See*—
Boehm, Horst; and Hellberg, Karl-Heinz, 4,222,967, Cl. 260-653.800.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. 4,4'-Disubstituted diphenylamines and the use thereof in dye composition for keratinic fibers. 4,222,958, Cl. 260-559.00D.
Kaltenbach & Voigt GmbH & Co.: *See*—
Strohmaier, Ernst, 4,222,738, Cl. 433-105.000.
Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Kamei, Tomiro. Medallion. 4,222,189, Cl. 40-160.000.
Kamiharako, Shozo: *See*—
Goi, Yoshihiro; and Kamiharako, Shozo, 4,222,587, Cl. 280-804.000.
Kamiyama, Hideo: *See*—
Motojima, Kenji; Tachikawa, Enzo; and Kamiyama, Hideo, 4,222,892, Cl. 252-428.000.
Kanamori, Takahiro: *See*—
Takahashi, Fuminobu; Kanamori, Takahiro; and Suzuki, Kazumichi, 4,222,273, Cl. 73-603.000.
Kane, Jeffrey, to Ferranti Limited. Semiconductor device body having identical isolated composite resistor regions. 4,223,335, Cl. 357-48.000.
Kaneda, Nobuo: *See*—
Berliner, Emanuel; Spiegel, Elwyn; and Kaneda, Nobuo, 4,222,390, Cl. 128-677.000.
Kaneko, Atsunobu, to Nitto Seiko Kabushiki Kaisha. Automatic screw feeding apparatus. 4,222,495, Cl. 221-68.000.
Kaneko, Nobutaka: *See*—
Suzuki, Hideo; Fujiwara, Toshihide; and Kaneko, Nobutaka, 4,222,843, Cl. 204-299.00R.
Kang, Jung W.: *See*—
Schulz, Donald N.; and Kang, Jung W., 4,223,103, Cl. 528-168.000.
Kanzaki Paper Mfg. Co., Ltd.: *See*—
Okimoto, Tomoyuki; Shiozaki, Tomoharu; and Miyake, Makoto, 4,222,891, Cl. 252-316.000.
Kao, Joseph P. Y.: *See*—
Goodner, Willis R.; and Kao, Joseph P. Y., 4,222,839, Cl. 204-192.00E.
Kaplan, Jerome I., to Indianapolis Center for Advanced Research. Dental x-ray aligning system. 4,223,228, Cl. 250-491.000.
Karayannis, Nicholas M.; and Grams, Harold, to Standard Oil Company (Indiana). Process for forming high performance titanium trichloride olefin polymerization catalyst components. 4,222,893, Cl. 252-429.00B.
Kariyama, Shisou: *See*—
Shimizu, Kazuma; Nomoto, Yoshitaka; and Kariyama, Shisou, 4,222,720, Cl. 418-121.000.
Karklins, Elgin J.; and Spindler, Charles W., to General Motors Corporation. Plastic dust tube for shock absorber and method of manufacture. 4,222,805, Cl. 156-184.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Winter, Karl, 4,222,249, Cl. 66-120.000.
Karlsson, Borje. Device for feeding logs. 4,222,420, Cl. 144-246.00A.
Kartsev, Alexei K.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.
Kasper, Klaus B.; and Hill, John A., III, to Mead Corporation, The. Process for producing casting release paper and product. 4,222,973, Cl. 264-22.000.
Kasper, Witold A. Sound-suppressing and back pressure-reducing apparatus and method. 4,222,456, Cl. 181-296.000.
Kast, Hellmut; Grychtol, Klaus; and Feichtmayr, Franz, to BASF Aktiengesellschaft. Triphenylmethane dyes. 4,223,144, Cl. 544-392.000.
Kastinger, Hermann. Ski boot. 4,222,184, Cl. 36-121.000.
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Axial flow fan having auxiliary blade. 4,222,710, Cl. 416-236.00A.
Kataoka, Takahiro: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.
Kato, Akihiko: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.
Kato, Isamu. Dialyzing method of blood in artificial kidney. 4,222,869, Cl. 210-646.000.
Kato, Keizo: *See*—
Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, 4,223,187, Cl. 179-100.10G.
Katz, David H., to Scripps Clinic & Research Foundation. Induction of immunological tolerance. 4,222,907, Cl. 260-6.000.
Kawahara, Masao: *See*—
Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; and Kawahara, Masao, 4,223,118, Cl. 526-128.000.
Kawai, Masayoshi: *See*—
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.
Kawai, Noriaki: *See*—
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.
Kawamura, Kunio: *See*—
Niwa, Masatake; Inoue, Norihiro; Kawamura, Kunio; and Beppu, Norio, 4,222,649, Cl. 354-173.000.
Kawamura, Takeo; and Matsunaga, Teruo, to Teijin Limited. Polyester composition. 4,222,928, Cl. 260-40.00R.
Kawano, Asaji: *See*—
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Kawarada, Osamu; Nakane, Takeshi; and Kondo, Isao, to Olympus Optical Co., Ltd. Adaptor for auto strobo unit. 4,222,647, Cl. 354-145.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueda, Yoshiteru, 4,222,360, Cl. 123-195.00C.
Kawasaki, Kishio: *See*—
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Kawasaki, Masahiro: *See*—
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Kawasaki, Teruo: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.
Kearney, Michael: *See*—
Greenberg, Mishel; Kearney, Michael; and Chernack, Milton P., 4,222,268, Cl. 73-371.000.
Keck, Max H., to Goodyear Tire & Rubber Company, The. Linear copolyesters containing tertiary butyl isophthalic acid. 4,223,126, Cl. 528-305.000.
Kedda, Helena M. Process for making glass design pieces. 4,222,759, Cl. 65-23.000.
Kehl, Donald K., to Crist, Eugene A. Hydroponics growing conduit. 4,222,199, Cl. 47-59.000.
Kehl, William L.: *See*—
Innes, Robert A.; and Kehl, William L., 4,222,899, Cl. 252-469.000.
Kelderman, Hendrik C.: *See*—
Van Berkel, Johannes; Syrier, Johannes L. M.; and Kelderman, Hendrik C., 4,222,964, Cl. 568-420.000.
Keller, Alois, to Gebrueder Buehler AG. Drum-type screening machine. 4,222,864, Cl. 209-284.000.
Keller, David P., to Cities Service Company. Muffle calciner having counter-rotating screw conveyors. 4,222,987, Cl. 422-150.000.
Keller, Jack H.: *See*—
Hoaglin, Harold B.; Grill, James R.; and Keller, Jack H., 4,222,795, Cl. 148-9.600.
Keller, John T.; and Wake, Robert H., to Ohio Nuclear Inc. Variable persistance video display. 4,223,353, Cl. 358-230.000.
Keller, Karlfried: *See*—
Honel, Hans; Keller, Karlfried; Michel, Walter; and Schon, Manfred, 4,223,141, Cl. 544-196.000.
Keller, Teddy M.; and Griffith, James R., to United States of America, Navy. Aliphatic phenoxy polyphthalocyanine. 4,223,123, Cl. 528-210.000.
Kelley, Hugh D. Conveyor for handling free-flowing material. 4,222,482, Cl. 198-721.000.
Kemp, Willard E., to Foundry Management, Inc. Foundry process including heat treating of produced castings in formation sand. 4,222,429, Cl. 164-34.000.
Kennecott Copper Corporation: *See*—
Hubred, Gale L.; and Owen, Edwin L., 4,222,832, Cl. 204-106.000.
Kent, Raymond C.; and Haines, Charles, Jr., to Armstrong Cork Company. Method of making fabric covered ceiling board. 4,222,803, Cl. 156-85.000.
Kenworthy, E. J. Doyle, to Mead Corporation, The. Planar-faced electrode for ink jet printer and method of manufacture. 4,223,321, Cl. 346-75.000.
Kerivan, Leo J., to Industrial Blast Coil Corporation. Method of making heat exchange tubing assembly. 4,222,160, Cl. 29-157.30A.
Kerr-McGee Corporation: *See*—
Riggs, Olen L., Jr.; and Brunsell, Dennis A., 4,222,826, Cl. 204-1.500.
Kerr, Robert J.; and Stastny, Milos, to Corning Glass Works. Acidic agar gel electrochromatography of glycohemoglobins. 4,222,836, Cl. 204-180.00G.
Kershaw Manufacturing Company, Inc.: *See*—
McCray, Philip C.; and Hammond, George B., 4,222,418, Cl. 144-2.00Z.
Kesling, Haven S., Jr., to Atlantic Richfield Company. Process for the preparation of aromatic formamides. 4,222,959, Cl. 260-562.00R.
Kessler, Gerald. Insulating spacer for double insulated glass. 4,222,213, Cl. 52-790.000.
Kewpie Kabushiki Kaisha: *See*—
Takano, Motoharu, 4,222,215, Cl. 53-331.500.
Keystone International, Inc.: *See*—
Aldrich, Joe L., 4,222,267, Cl. 73-304.00C.
Khardin, Alexandr P.: *See*—
Gorbunov, Boris N.; Khardin, Alexandr P.; Valdman, Alexandr I.; Rykov, Vyacheslav K.; and Sukhanov, Stanislav V., 4,222,965, Cl. 568-461.000.
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N. Shield for constructing tunnels with in-situ formed concrete lining. 4,222,681, Cl. 405-141.000.
Kieft, Gerald N.; and Hildebrand, Donald L., to Elgin Sweeper Company. Street sweeper and main broom suspension. 4,222,141, Cl. 15-84.000.
Kikuchi, Toshikazu, to Hope Co., Ltd. Ski boot heel binding. 4,222,584, Cl. 280-626.000.
Kilmer, Robert: *See*—
Allen, Donnie E.; Kilmer, Robert; Guy, Thomas L.; and Fosnow, Wesley C., 4,222,564, Cl. 273-369.000.
Kim, Ki-Soo; Yu, Arthur J.; and Altscher, Siegfried, to Stauffer Chemical Company. Copoly (carbonate/phosphonate) compositions. 4,223,104, Cl. 528-169.000.
Kim, Mujo; and Kim, Yonsu. Engine key reminder system for automobile. 4,223,296, Cl. 340-52.00D.
Kim, Yonsu: *See*—
Kim, Mujo; and Kim, Yonsu, 4,223,296, Cl. 340-52.00D.
Kimmel, Peter S. Light transmitting structure. 4,223,374, Cl. 362-31.000.
Kimura, Ichiro: *See*—
Takayama, Shuichi; Ishikawa, Takehito; Kimura, Ichiro; and Shigematu, Syozi, 4,222,765, Cl. 71-88.000.
Kimura, Yoichi: *See*—
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Kinchen, Bruce E.: *See*—
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Kine, Masayoshi, to Shimano Industrial Company, Limited. Hand brake control device having adjustable main and auxiliary levers. 4,222,285, Cl. 74-480.00R.
King, David L.: *See*—
Newman, Howard F.; and King, David L., 4,223,093, Cl. 435-295.000.
King, Eugene O., Jr.; and Stewart, D. Fred, to Aluminum Company of America. Gauge control using estimate of roll eccentricity. 4,222,254, Cl. 72-8.000.
King, William E.; and Calhoun, Gregory L., to Westinghouse Electric Corp. Tube sheet pan and tilt camera platform. 4,222,540, Cl. 248-205.00R.
Kinoshita, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Delayed line for sense amplifier pulse. 4,223,396, Cl. 365-194.000.
Kinsley, Ronnie L.: *See*—
Jackson, Clifton E.; and Kinsley, Ronnie L., 4,222,361, Cl. 124-5.000.
Kircher, Everett F.; and Dilworth, James L., to Boyne Mountain Lodge, Inc. Method and machine for making artificial snow. 4,222,519, Cl. 239-14.000.
Kirschke, John A. Apparatus and process for repairing underground gasoline tanks. 4,222,975, Cl. 264-35.000.
Kirschner, Jurgen: *See*—
Hofer, Wolfgang O.; Kirschner, Jurgen; and Thum, Franz, 4,223,223, Cl. 250-397.000.

Kishi, Yoshio, to Sony Corporation. Tape recording and/or reproducing apparatus. 4,223,362, Cl. 360-137.000.

Kishimoto, Shinzo: *See*—
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.

Kishino, Takao; Kawasaki, Kishio; and Yamaguchi, Nobuo, to Futaba Denshi Kogyo K.K. Fluorescent display device with position selecting and column/row selecting grids. 4,223,244, Cl. 313-497.000.

Kitamura, Akinori. Earthquake resistant, even loaded man-made land structure and method of making same. 4,222,206, Cl. 52-167.000.

Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, to Canon Kabushiki Kaisha. Recording position adjuster. 4,222,643, Cl. 354-7.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,222,941, Cl. 260-345.100.

Kleemann, Axel; Schalke, Peter; and Arnoldi, Detlef, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of cyanocarboxylic acids. 4,222,956, Cl. 260-465.400.

Klein, Robert R.: *See*—
Makowski, Henry S.; Klein, Robert R.; Lundberg, Robert D.; and Bock, Jan, 4,222,914, Cl. 260-23.70B.

Kleinschmidt, Peter; and Meixner, Hans, to Siemens Aktiengesellschaft. Heater with a ferro-electric ceramic heating element. 4,223,208, Cl. 219-530.000.

Klimenko, Lidia A.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.

Klippan Automotive Products AB: *See*—
Andersson, Arne, 4,222,609, Cl. 297-468.000.

Kloeckner Werke: *See*—
Bell, Gunter; and Watermann, Willy, 4,222,686, Cl. 405-295.000.

Kloker, Werner: *See*—
Schulz-Walz, Hansjochen; Hess, Bernhard; Beckers, Johannes; and Kloker, Werner, 4,222,927, Cl. 260-40.00R.

Kluger, Michael A.; and DuCharme, Robert T., to Bendix Corporation, The. Drum brake adjuster. 4,222,467, Cl. 188-79.5GE.

Kmak, Walter S.; and Yatabe, Akira, to Exxon Research & Engineering Co. Method for removing coronene from heat exchangers. 4,222,852, Cl. 208-48.00R.

Knauer, Rudolf: *See*—
Baur, Guenter; Greubel, Waldemar; Knauer, Rudolf; and Krueger, Hans, 4,222,880, Cl. 455-617.000.

Kneitel, Dieter: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,222,995, Cl. 423-329.000.

Knittel, Gerald H.: *See*—
Bryant, Earle R.; Knittel, Gerald H.; and Dircks, Lon E., 4,222,925, Cl. 260-37.00N.

Knopf, Robert J.: *See*—
Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., 4,223,119, Cl. 528-66.000.

Kobayashi, Akio: *See*—
Sano, Takezo; Kobayashi, Akio; and Yamada, Yasuharu, 4,223,117, Cl. 526-121.000.

Kobayashi, Minoru, to Olympus Optical Co., Ltd. Device for sensing and indicating the end of a tape in a tape recorder. 4,222,536, Cl. 242-191.000.

Kobayashi, Takao: *See*—
Mori, Masahiko; Hanaoka, Seiji; and Kobayashi, Takao, 4,222,674, Cl. 400-124.000.

Kobayashi, Takumi: *See*—
Urano, Fumio; and Kobayashi, Takumi, 4,222,651, Cl. 354-214.000.

Kobayashi, Toshiaki: *See*—
Ikeda, Toshihide; Kobayashi, Toshiaki; Nakano, Motokiyo; and Tanaka, Chiaki, 4,222,908, Cl. 260-16.000.

Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying apparatus for internal combustion engine. 4,222,237, Cl. 60-276.000.

Kohler, Kurt: *See*—
Horner, Gerhard; and Kohler, Kurt, 4,222,144, Cl. 15-317.000.

Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Solid-state imaging device. 4,223,330, Cl. 357-32.000.

Koinuma, Tokuju: *See*—
Ogura, Koichi; and Koinuma, Tokuju, 4,223,245, Cl. 315-39.510.

Koizumi, Akio, to Sony Corporation. Switching regulator. 4,223,378, Cl. 363-26.000.

Kojima, Hideto; and Funakoshi, Hisashi, to Nippon Electric Co., Ltd. Semiconductor integrated circuit with electrode pad suited for a characteristic testing. 4,223,337, Cl. 357-68.000.

Kojima, Yukio: *See*—
Tsuzura, Junichi; and Kojima, Yukio, 4,222,424, Cl. 152-209.00B.

Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., to Union Carbide Corporation. High solids compositions containing ester diol alkoxylate and organic polyisocyanate. 4,223,119, Cl. 528-66.000.

Kollmorgen Technologies Corporation: *See*—
Nuzzi, Francis J.; and Vitellaro, Daniel F., 4,222,778, Cl. 106-1.110.

Kominek, Leo A.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,223,092, Cl. 435-55.000.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Copying apparatus for sheet originals and thicker originals. 4,222,659, Cl. 355-14.00R.

Kondo, Hiroyuki: *See*—
Takeshita, Hiroshi; Nagashima, Takashi; and Kondo, Hiroyuki, 4,222,613, Cl. 303-6.00C.

Kondo, Hisao: *See*—
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,223,327, Cl. 357-15.000.

Kondo, Isao: *See*—
Kawarada, Osamu; Nakane, Takeshi; and Kondo, Isao, 4,222,647, Cl. 354-145.000.

Konheim, Alan G.; and Tuckerman, Louis B., III, to International Business Machines Corporation. Cryptographic architecture for use with a high security personal identification system. 4,223,403, Cl. 375-2.000.

Konig, Dieter: *See*—
Moench, Clauspeter; Scheffels, Wilhelm; Konig, Dieter; and Steigerwald, Karl H., 4,223,200, Cl. 219-121.0EB.

Koontz, Kathleen B. Segmental technique for sizing garments. 4,222,170, Cl. 33-17.00R.

Koorneef, Jacob, to U.S. Philips Corporation. Method of manufacturing a color display tube shadow mask. 4,222,159, Cl. 29-25.140.

Kopich, Leonard F., to General Motors Corporation. Four way pawl clutch. 4,222,473, Cl. 192-43.100.

Koppers Company, Inc.: *See*—
Hergenrother, P. Richard, 4,222,916, Cl. 260-285.0AS.

Korber, Helmut: *See*—
von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

Koriev, Anatoly S.: *See*—
Tjurin, Nikolai A.; Lysov, Georgy V.; Koriev, Anatoly S.; Kuznetsova, Nina L.; and Zamorenov, Anatoly T., 4,222,176, Cl. 34-1.000.

Kormany, Geza: *See*—
Kagi, Bruno; Kormany, Geza; and Luthi, Christian, 4,222,739, Cl. 8-648.000.

Korolev, Vladimir N.: *See*—
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.

Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, to Nissan Motor Company, Limited. Process for reforming hydrocarbon fuel into hydrogen-rich fuel. 4,222,351, Cl. 123-3.000.

Koshear, Inc.: *See*—
Brown, August R., 4,222,388, Cl. 128-479.000.

Koshiishi, Kiyozo, to Olympus Optical Co., Ltd. Liquid sample analyzer. 4,222,670, Cl. 356-414.000.

Kost, Willi: *See*—
Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., 4,223,095, Cl. 521-55.000.

Kostovetsky, Semen P.; Odinokov, Boris P.; Semenikhin, Anatoly Y.; Sankov, Anatoly E.; and Soin, Vladimir V. Method of mining flat-dipping and sloping beds of a mineral with hydraulic excavation. 4,222,612, Cl. 299-11.000.

Kotera, Nobuo: *See*—
Morikawa, Juichi; and Kotera, Nobuo, 4,223,292, Cl. 338-32.00H.

Kothmann, Richard E.: *See*—
Sweetana, Andrew S., Jr.; Gupta, Tapan K.; Kothmann, Richard E.; and Osterhout, Joseph C., 4,223,366, Cl. 361-127.000.

Kouloumbini, Aliki-Niki; and Anderson, Ernest E. Muffin separator and muffin holder and safety guard. 4,222,510, Cl. 225-94.000.

Kouth, Herbert, to Rockwell-Golde G.m.b.H. Blocking device for hand crank drives on automobile sliding roofs. 4,222,602, Cl. 296-137.00G.

Koyama, Toru: *See*—
Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, 4,222,802, Cl. 156-53.000.

Kramer, Jack M. Clamp for clamping tubing, wire bundles, or the like. 4,222,539, Cl. 248-74.00B.

Kramer, Jerry M.; and Haugsjaa, Paul O., to GTE Laboratories Incorporated. Protective coatings for light sources. 4,223,250, Cl. 315-248.000.

Kramer, Pieter: *See*—
Bouwhuis, Gijsbertus; and Kramer, Pieter, 4,223,347, Cl. 358-128.500.

Krause, Peter: *See*—
Gellert, Jobst U.; and Krause, Peter, 4,222,733, Cl. 425-566.000.

Krauss-Maffei Austria Gesellschaft m.b.H.: *See*—
Bacher, Helmut; and Schulz, Helmuth, 4,222,728, Cl. 425-305.100.

Krechmery, Roger L., to Babcock & Wilcox Company, The. Isotropic etching of silicon strain gages. 4,222,815, Cl. 156-630.000.

Kreis, Gerhard; and August, Peter, to Consortium fur Elektrochemische Industrie GmbH. Addition of Si-bonded hydrogen to an aliphatic multiple bond. 4,222,951, Cl. 556-478.000.

Krogerus, Helge J.: *See*—
Tuovinen, Frans H.; Honkaniemi, Matti E.; Virta, Matias A.; and Krogerus, Helge J., 4,222,786, Cl. 106-117.000.

Krokonko, Joseph. Refuse bag holder assembly. 4,222,580, Cl. 280-47.340.

Kruckenberg, Winfried: *See*—
Hederich, Volker; Kruckenberg, Winfried; and Schundehutte, Karl H., 4,222,947, Cl. 260-380.000.
Krueger, Hans: *See*—
Baur, Guenter; Greubel, Waldemar; Knauer, Rudolf; and Krueger, Hans, 4,222,880, Cl. 455-617.000.
Kruegle, Herman, to Visual Methods, Inc. Access control system. 4,222,662, Cl. 355-40.000.
Krumrey, Hans-Peter: *See*—
Wolff, Friedrich; Holter, Hans-Joachim; and Krumrey, Hans-Peter, 4,222,203, Cl. 51-3.000.
Kruse, Carl A. B.: *See*—
Danielsson, Per-Erik; and Kruse, Carl A. B., 4,223,387, Cl. 364-515.000.
Krutik, Ernst N.: *See*—
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.
Krystyniak, Casimir W., to General Electric Company. Magnetically tagging ammunition cartridges. 4,222,330, Cl. 102-38.00R.
Kryzanowsky, Dmytro M. Musical justification for guitars and the like. 4,222,303, Cl. 84-315.000.
Kubo, Masaharu: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, to Kurosaki Refractories Co., Ltd. Apparatus for applying refractory material onto the inner surface of a furnace. 4,222,522, Cl. 239-160.000.
Kubolis, William J.; and Chun, Victor L., to Eaton Corporation. Inching control system for industrial lift trucks. 4,222,469, Cl. 192-4.00A.
Kubota, Naohiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,222,931, Cl. 260-45.8NZ.
Kubota, Yukio; Noji, Keiko; and Watanabe, Yoshimi, to Sony Corporation. Method and apparatus for cancelling the remanent deflection in a piezoceramic head support means of a video recorder. 4,223,358, Cl. 360-75.000.
Kudryavtsev, Lev A.: *See*—
Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A., 4,222,666, Cl. 356-243.000.
Kuffel, Wolfgang: *See*—
Schaloske, Peter; Kuffel, Wolfgang; and Brinkmann, Franz J., 4,222,683, Cl. 405-204.000.
Kugelmann, Adolf: *See*—
Drews, Ulrich; Werner, Peter; Moder, Helmut; and Kugelmann, Adolf, 4,222,352, Cl. 123-484.000.
Kuhner, Albert: *See*—
Brackmann, Warren A.; and Kuhner, Albert, 4,222,397, Cl. 131-138.00R.
Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,222,277, Cl. 73-721.000.
Kullander, Mats O.: *See*—
Johansson, Gunnar; and Kullander, Mats O., 4,222,342, Cl. 118-50.000.
Kumada, Masaharu: *See*—
Misumi, Akira; and Kumada, Masaharu, 4,222,775, Cl. 75-170.000.
Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air conditioning display system for vehicles. 4,222,435, Cl. 165-11.00R.
Kumiai Chemical Industry Co., Ltd.: *See*—
Takayama, Shuichi; Ishikawa, Takehito; Kimura, Ichiro; and Shigematu, Syozi, 4,222,765, Cl. 71-88.000.
Kuniya, Jiro: *See*—
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yositeru; and Kuniya, Jiro, 4,223,197, Cl. 219-61.700.
Kupfer, Charles: *See*—
Lee, Thomas M.; and Kupfer, Charles, 4,222,191, Cl. 42-77.000.
Kuramochi, Kouziro: *See*—
Watanabe, Kazuaki; Kuramochi, Kouziro; and Terakara, Yukio, 4,222,289, Cl. 74-740.000.
Kuraray Co., Ltd.: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.
Shibatani, Kyoichiro; Omura, Ikuo; and Yamauchi, Junichi, 4,222,780, Cl. 106-35.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Tomonaga, Atsushi; and Aoki, Hideki, 4,222,128, Cl. 3-1.900.
Kurek, Harry F.; and Silvester, Austin R., to Kurek, Harry F. Method and apparatus for loading circuit boards. 4,222,166, Cl. 29-831.000.
Kuris, Arthur. Ultrasonic oil spill removal. 4,222,868, Cl. 210-748.000.
Kurosaki Refractories Co., Ltd.: *See*—
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,222,522, Cl. 239-160.000.
Kurosawa, Kenzo; and Hachimura, Fukuji, to Gakken Co., Ltd. Combination of running toy and track along which toy runs. 4,222,195, Cl. 46-202.000.
Kurowsky, Stephen R., to Pfizer Inc. Terpolymers of maleic anhydride and their use as scale control agents. 4,223,120, Cl. 526-208.000.
Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Media compatible pressure transducer. 4,222,277, Cl. 73-721.000.
Kurzweil, Karel: *See*—
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,222,516, Cl. 235-492.000.
Kush, Stephen T.: *See*—
Dassele, Michael A.; Kush, Stephen T.; and Mitchell, Don E., 4,222,629, Cl. 350-96.200.
Kuznetsova, Nina L.: *See*—
Tjurin, Nikolai A.; Lysov, Georgy V.; Koriev, Anatoly S.; Kuznetsova, Nina L.; and Zamorenov, Anatoly T., 4,222,176, Cl. 34-1.000.
Kwasiborski, Stanley, Jr.: *See*—
Cripps, David J.; and Kwasiborski, Stanley, Jr., 4,222,600, Cl. 296-37.100.
La Nationale S.A.: *See*—
Zellweger, Conrad; and Biondina, Joseph, 4,222,148, Cl. 16-128.00A.
Labaz: *See*—
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, 4,223,041, Cl. 424-322.000.
Laborde, Martin: *See*—
Jefferson, Gene; and Laborde, Martin, 4,222,685, Cl. 405-270.000.
Lacolle, Jean-Yves: *See*—
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, 4,223,041, Cl. 424-322.000.
Lacy, Garry T., to General Dynamics Corporation. Digitally controlled servo system. 4,223,258, Cl. 318-599.000.
Ladwig, Richard D., to Combustion Engineering, Inc. Method of wallboard manufacture. 4,222,984, Cl. 264-261.000.
Lafarge: *See*—
Caspar, Jean-Pierre; and Gaillard, Jacques, 4,222,784, Cl. 106-93.000.
Laffitte, Andre; and Delair, Jacques, to Compagnie Generale de Radiologie. Tomographic system having a single case on which are carried the X-ray tubes and detectors. 4,223,225, Cl. 250-445.00T.
Lagoni, William A.; and Fuhrer, Jack S., to RCA Corporation. Video image vertical detail restoration and enhancement. 4,223,339, Cl. 358-31.000.
Lagoni, William A.: *See*—
Bingham, Joseph P.; and Lagoni, William A., 4,223,340, Cl. 358-31.000.
Lake, Charles W.; and Weber, Herb, to Worldwide Blast Cleaning Limited. Blast cleaning machine for pipes and other cylindrical objects. 4,222,205, Cl. 51-420.000.
Lalonde, Michael G. Ice tray. 4,222,547, Cl. 249-120.000.
Lamb, Charles A. Tilting cab for vans. 4,222,451, Cl. 180-89.180.
Laneres, Jacques: *See*—
Leblanc, Michel; Laneres, Jacques; and Perrin, Jean, 4,222,261, Cl. 73-29.000.
Lange, Hans-Rudolf: *See*—
Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, 4,223,089, Cl. 435-12.000.
Langenfeld, Joseph W.: *See*—
Westendorf, Neal W.; and Langenfeld, Joseph W., 4,222,442, Cl. 172-273.000.
Langheim, Franz: *See*—
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 201-2.500.
Lannert, Kent P.: *See*—
Crutchfield, Marvin M.; Lannert, Kent P.; and Upton, Charles J., 4,223,162, Cl. 562-583.000.
Lantzsch, Reinhard: *See*—
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, 4,223,147, Cl. 546-224.000.
Laporte Industries Limited: *See*—
Horton, Anthony; McKeon, Thomas M.; and Preston, Jack, 4,223,206, Cl. 219-374.000.
Lappas, Lewis C.; Lorenz, Leslie J.; and Wikel, James H., to Eli Lilly and Company. Crystalline forms of N-2-(6-methoxy)benzothiazolyl N'-phenyl urea. 4,223,153, Cl. 548-163.000.
Larsen, Charles H.; and Heeres, Cornelis J., to Western Gear Corporation. Riser tensioning wave and tide compensating system for a floating platform. 4,222,341, Cl. 114-264.000.
Larson, Clayton E., to White Metal Rolling and Stamping Corp. Extension ladders. 4,222,460, Cl. 182-211.000.
Larson, Larry L., to Dow Chemical Company, The. Insecticidal synergistic mixture of O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl)phosphorothioate and O-ethyl O-(2-chloro-4-bromophenyl)-S-n-propyl phosphorothioate. 4,223,026, Cl. 424-200.000.
Larson, William C.; and Morrell, Roger J., to United States of America, Interior. In-situ leach mining method using branched single well for input and output. 4,222,611, Cl. 299-4.000.
Lass, John L., to Square D Company. Locking member for outlet box cable. 4,223,178, Cl. 174-65.00R.
Lasswell, Fred D. Spindle construction for citrus fruit picker. 4,222,219, Cl. 56-328.00R.
Latimer, Robert C.; and Pomeroy, Gary W., to Golden West Homes. Apparatus and method for erecting a mobile home on a preexisting lot. 4,222,207, Cl. 52-169.300.
Lauffenburger, Robert F. Fluid-conveying coupling with safety locking device. 4,222,593, Cl. 285-85.000.
Lavoo, Norman T.: *See*—
Oliver, David W.; and Lavoo, Norman T., 4,223,243, Cl. 313-268.000.

Lavorazione Materie Plastiche L.M.P. S.p.A.: *See*—
Ragazzini, Franco; and Colombo, Roberto, 4,222,729, Cl. 425-378.00R.
Lawrence, John P.: *See*—
Chung, Daniel A.; and Lawrence, John P., 4,222,955, Cl. 260-465.00E.
Layne, Charles R., to Martin Marietta Corporation. Fizeau fringe light evaluator and method. 4,222,667, Cl. 356-346.000.
Lazarus, Norman R., to Burroughs Wellcome Co. Biologically active amides. 4,223,017, Cl. 424-177.000.
Le Materiel Telephonique: *See*—
Picou, Claude H., 4,223,185, Cl. 179-84.0VF.
Leach, George S.: *See*—
Hartman, John M.; and Leach, George S., 4,222,165, Cl. 29-579.000.
Leavens, Richard; and Evans, Arthur D., to Mohawk Industries, Inc. Draft tube for wood burning stoves. 4,222,363, Cl. 126-77.000.
Le Blanc, Arthur E.: *See*—
Hsia, Jen C.; Le Blanc, Arthur E.; and Marshman, Joan A., 4,223,004, Cl. 424-9.000.
Leblanc, Michel; Laneres, Jacques; and Perrin, Jean, to Institut Textile de France; Leblanc, Michel; and Agence Nationale de Valorisation de la Recherche (ANVAR). Device for measuring the water content of a moving gas. 4,222,261, Cl. 73-29.000.
LeBrise, Raymond, to Societe Anonyme Francaise du Ferodo. Torsion damping device for friction plate having a flexible center. 4,222,476, Cl. 192-106.200.
Lee, Harold D.; and Carimi, Darryl L., to Kain's Research & Development Company, Inc. Pressurized fluid dispensing apparatus having expansible bladder held in place with compressive forces. 4,222,499, Cl. 222-183.000.
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., to Reynolds Metals Company. Container. 4,222,494, Cl. 220-66.000.
Lee, Richard J. Tool for installing primers in ammunition cartridges. 4,222,305, Cl. 86-37.000.
Lee, Thomas M.; and Kupfer, Charles. Conversion plug. 4,222,191, Cl. 42-77.000.
Lee, Yoon C.; and Trementozzi, Quirino A., to Monsanto Company. Rubber-modified terpolymer with improved molding characteristics. 4,223,096, Cl. 525-74.000.
Lefeuvre, Antoine A. J., to Societe d'Etudes et de Realisations Industrielles - SERI. Improvements in the separation of liquid mixtures by ultrafiltration. 4,222,871, Cl. 210-636.000.
Lehmann, Rolf, to Escher Wyss Aktiengesellschaft. Rolling device having at least one controlled deflection roll. 4,222,255, Cl. 72-20.000.
Leiba, Eugene: *See*—
Assouline, Georges; Hareng, Michel; and Leiba, Eugene, 4,222,636, Cl. 350-350.00R.
Lemaire, Francis; Salkazanov, Pierre; and Bavoux, Robert, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Clock-signal generator for a data-processing system. 4,223,392, Cl. 364-900.000.
LeMay, Lowell. Nut removal tool. 4,222,688, Cl. 408-115.00B.
Le Mehaute, Alain: *See*—
Armand, Michel; Brec, Raymond; and Le Mehaute, Alain, 4,223,078, Cl. 429-194.000.
Lemke, Gregory D., to Rexnord Inc. Linear motion thrust block for hydraulic pumps and motors. 4,222,718, Cl. 418-26.000.
Lenorak, Ferdinand, to Slovenska vedecko-technicka spolocnost, Dom techniky. Winding machine with multitwist spindle. 4,222,221, Cl. 57-58.490.
Leo, Angelo F.: *See*—
Zentner, Mark R.; Zahora, Edward P.; and Leo, Angelo F., 4,222,918, Cl. 260-29.2EP.
Lerch, Joachim; and Seitz, Gerhard, to Siemens Aktiengesellschaft. Television camera. 4,223,355, Cl. 358-248.000.
Le Rolland, Pierre M.: *See*—
Quere, Eugene M.; and Le Rolland, Pierre M., 4,223,370, Cl. 361-331.000.
Lerwill, William E., to Seismograph Service Corporation. Vibration generators. 4,222,455, Cl. 181-121.000.
Lesher, George Y.: *See*—
Opalka, Chester J., Jr.; and Lesher, George Y., 4,223,149, Cl. 546-257.000.
Lester, William D.: *See*—
Fachini, Robert M.; and Lester, William D., 4,222,452, Cl. 180-162.000.
Leuchter, Jurgen, to AGFA-Gevaert, A.G. Continuous film-developing machine. 4,222,657, Cl. 354-324.000.
Leuthard, Ronald P. Unidirectional rotation turbine apparatus with reverse flow. 4,222,700, Cl. 415-7.000.
Levanoni, Menachem: *See*—
Bogardus, E. Hal; Hildenbrand, Walter W.; and Levanoni, Menachem, 4,223,318, Cl. 346-1.100.
Levatter, Jeffrey I.: *See*—
Bradford, Robert S., Jr.; Braverman, Leonard W.; and Levatter, Jeffrey I., 4,223,279, Cl. 331-94.5PE.
Levens, Dennis L., to Minnesota Mining and Manufacturing Company. Foam-like pressure-sensitive adhesive tape. 4,223,067, Cl. 428-308.000.
Lever Brothers Company: *See*—
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,222,979, Cl. 264-75.000.
Lever, Reginald F.; Mauer, John L., IV; Michel, Alwin E.; and Rothman, Laura B., to International Business Machines Corporation. Planar deep oxide isolation process utilizing resin glass and E-beam exposure. 4,222,792, Cl. 148-1.500.
Levin, Evsey P.: *See*—
Drone, Gary A.; and Levin, Evsey P., 4,222,287, Cl. 74-529.000.
Levine, Peter A., to RCA Corporation. Reduction of sparkle noise and mottling in CCD imagers. 4,223,234, Cl. 307-221.00D.
Levolor Lorentzen, Inc.: *See*—
Anderle, Joseph A., 4,222,156, Cl. 24-73.00B.
Levy, Mark A.; and Tester, Jack R. Screen repair. 4,222,162, Cl. 29-402.090.
LGZ Landis & Gyr Zug AG: *See*—
Nyfeler, Alex; and Greenaway, David L., 4,223,050, Cl. 427-163.000.
Li, George S.; and Rosen, Irving, to Standard Oil Company. Blends of thermoplastic resins and polyindene or coumarone-indene. 4,223,107, Cl. 525-206.000.
Libbey-Owens-Ford Company: *See*—
Revells, Robert G.; and Rahrig, Donald D., 4,222,764, Cl. 65-348.000.
Lichtenthaler, Frieder W.: *See*—
Cuny, Eckehard K. T.; and Lichtenthaler, Frieder W., 4,223,143, Cl. 544-251.000.
Liedek, Egon; Dimroth, Peter; Ruff, Wolfgang; Berger, Gerhard; and Reiter, Peter, to BASF Farben & Fasern AG. Mixed pigment and process of preparing the same. 4,222,788, Cl. 106-289.000.
Light, Bette M.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Method for preparing oxyhydrocarbylnorbornane derivatives. 4,223,168, Cl. 568-345.000.
Lilly Industries, Limited: *See*—
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,222,946, Cl. 260-347.300.
Lime, Bernard: *See*—
Duval, Andre; and Lime, Bernard, 4,222,161, Cl. 29-235.000.
Lindgren, Mats, to Nordfor AB. Apparatus for breaking wood. 4,222,549, Cl. 254-93.0HP.
Lindner, Horst, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of armo-coating valve seats of internal combustion engines. 4,222,430, Cl. 164-61.000.
Linn, Wallace L. Engine. 4,222,231, Cl. 60-39.450.
l'Institut Francais du Petrole: *See*—
Brulet, Daniel; Pocheville, Robert; and Chauvel, Bernard, 4,222,882, Cl. 252-51.50A.
Linton, Robert G.: *See*—
Hansel, John H.; Linton, Robert G.; and Stanger, Charles W., Jr., 4,222,856, Cl. 208-120.000.
Lipp, Herbert: *See*—
Roettges, Werner; Becker, Wilfried; and Lipp, Herbert, 4,222,307, Cl. 89-37.00C.
Litton Industrial Products, Inc.: *See*—
Kaiser, Russell E., 4,222,362, Cl. 125-11.0CD.
Liu, Kou-Chang; and Howe, Robert K., to Monsanto Company. Preparation of 2-(3-aryl-5-isoxazol) benzoyl halide. 4,223,154, Cl. 548-248.000.
Lloyd, William A.; Wong, Herman; and McFarland, Keith E., to Xerox Corporation. System and method for monitoring and maintaining a predetermined concentration of material in a fluid carrier. 4,222,497, Cl. 222-57.000.
Lockwood, Christopher R. Cutter for cutting out profiles from sheet material. 4,222,169, Cl. 30-286.000.
LOF Plastics, Inc.: *See*—
Duewel, Ronald E., 4,222,812, Cl. 156-497.000.
Lofberg, Gustaf G., to Supra Aktiebolag. Pliant material container. 4,222,422, Cl. 150-1.000.
Logan, David J.: *See*—
Anderson, Verner; Logan, David J.; and Wood, Kenneth O., 4,222,396, Cl. 131-105.000.
Long, Edward W. Cyclone separator apparatus. 4,222,529, Cl. 241-77.000.
Lonning, Kjell: *See*—
Peters, George T.; and Lonning, Kjell, 4,223,201, Cl. 219-121.0LC.
Lopshire, Norval L.: *See*—
Brown, Raynard C.; and Lopshire, Norval L., 4,222,606, Cl. 296-183.000.
Lord Corporation: *See*—
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,223,115, Cl. 525-455.000.
L'Oreal: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,222,958, Cl. 260-559.00D.
Lorenz, Leslie J.: *See*—
Lappas, Lewis C.; Lorenz, Leslie J.; and Wikel, James H., 4,223,153, Cl. 548-163.000.
Louisville Manufacturing Co., Inc.: *See*—
Sewell-Wood, Tom, 4,222,125, Cl. 2-195.000.
Lowder, Dale E., to Clarke-Gravely Corporation. Vacuum cleaner carriage and tank assembly. 4,222,145, Cl. 15-353.000.
Lowenschuss, Oscar, to Raytheon Company. Apparatus for recycling complete cycles of a stored periodic signal. 4,223,404, Cl. 375-94.000.
Lucas Industries Limited: *See*—
Armstrong, Clifford M., 4,222,263, Cl. 73-116.000.

Lugovtsov, Anatoly S.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.

Luksch, Heinrich E.: *See*—
Choudhury, Hrishikesh; and Luksch, Heinrich E., 4,222,474, Cl. 192-0.096.

Lundberg, Robert D.: *See*—
Makowski, Henry S.; Klein, Robert R.; Lundberg, Robert D.; and Bock, Jan, 4,222,914, Cl. 260-23.70B.

Luogameno, Felix, to American Loose Leaf Corporation. Loose-leaf binder. 4,222,679, Cl. 402-75.000.

Lusk, George E.; and Northrup, Stephen D., to Joslyn Mfg. and Supply Co. Cable termination connector assembly. 4,223,179, Cl. 174-73.00R.

Luthi, Christian: *See*—
Kagi, Bruno; Kormany, Geza; and Luthi, Christian, 4,222,739, Cl. 8-648.000.

Lysov, Georgy V.: *See*—
Tjurin, Nikolai A.; Lysov, Georgy V.; Koriev, Anatoly S.; Kuznetsova, Nina L.; and Zamorenov, Anatoly T., 4,222,176, Cl. 34-1.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Mathes, Josef; and Melzer, Rudolf, 4,222,326, Cl. 101-183.000.

M&T Chemicals Inc.: *See*—
Gitlitz, Melvin H., 4,222,950, Cl. 260-429.700.
Treadwell, Kenneth, 4,223,098, Cl. 521-116.000.

Ma, Ching-Yee: *See*—
Schaum, Hans H.; Tedstone, Donald J.; Ma, Ching-Yee; and Sanderson, John J., 4,222,703, Cl. 415-53.00R.

MacDiarmid, Alan G.: *See*—
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Shirakawa, Hideki, 4,222,903, Cl. 252-518.000.

Maeda, Kouzo, to Nissan Motor Company, Limited. Control system for adjustable head restraint on automotive seat. 4,222,608, Cl. 297-410.000.

Maeda, Takashi: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.

Maekawa, Koichiro: *See*—
Oda, Isao; and Maekawa, Koichiro, 4,222,978, Cl. 264-65.000.

Magnum Automotive Equipment, Inc.: *See*—
Brosene, William G., Jr., 4,222,426, Cl. 157-1.280.

Mahler, Darrell G.; and Doumani, Charles, to Blue Cross Laboratories. Fabric softening product and method of use in dryer. 4,223,029, Cl. 427-242.000.

Mahone, Louis G., to Dow Corning Corporation. Method of preparing organosiloxanes and methylchloride. 4,222,953, Cl. 260-466.000.

Mahoney, Dennis C. Mouthpiece accessory and seal. 4,222,378, Cl. 128-206.240.

Mahoney, Murray W.: *See*—
Hamilton, C. Howard; Mahoney, Murray W.; and Paton, Neil E., 4,222,797, Cl. 148-12.70A.

Main Gas Appliances Limited: *See*—
Halstead, Christopher, 4,222,526, Cl. 239-556.000.

Mairson, Theodore, to Sanders Associates, Inc. Processor for an inertial measurement unit. 4,222,272, Cl. 73-517.00R.

Makowski, Henry S.; Klein, Robert R.; Lundberg, Robert D.; and Bock, Jan, to Exxon Research & Engineering Co. Process for forming a Zn sulfonate containing elastomer. 4,222,914, Cl. 260-23.70B.

Malacheski, Joseph J. Drafting instrument. 4,222,171, Cl. 33-26.000.

Malec, Robert E., to Ethyl Corporation. Antioxidant. 4,222,884, Cl. 252-52.00R.

Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,222,277, Cl. 73-721.000.

Malpass, Dennis B.: *See*—
Fannin, Loyd W.; and Malpass, Dennis B., 4,222,969, Cl. 260-665.00R.

Mandel, P. Friedrich. Device for applying the Kirlian photography for diagnosis purpose on human beings. 4,222,658, Cl. 354-354.000.

Mandet, Gerard M. F.: *See*—
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,222,706, Cl. 415-116.000.

Mange, Johannes, to Blohm & Voss AG. Summing gear assembly, particularly for ship drives. 4,222,288, Cl. 74-665.00B.

Manziek, Larry, to Rohm and Haas Company. Borane reducing resins. 4,223,173, Cl. 568-835.000.

Marchive, Daniel: *See*—
Boutin, Francois-Regis; Deleuze, Michel; Marchive, Daniel; and Reze, Rene, 4,222,774, Cl. 75-148.000.

Margalit, Nehemiah; and Maroney, Robert A., to ESB Technology Company. Non-aqueous primary battery having a stannous sulfide cathode. 4,223,079, Cl. 429-194.000.

Mark, Victor, to General Electric Company. Halogenated bisphenol-Z and derivatives thereof. 4,223,170, Cl. 568-721.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Substituted dichlorovinylidene (diphenols). 4,223,171, Cl. 568-726.000.

Markova, Marie: *See*—
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

Maroney, Robert A.: *See*—
Margalit, Nehemiah; and Maroney, Robert A., 4,223,079, Cl. 429-194.000.

Marpal AG: *See*—
Degen, Hugo, 4,222,134, Cl. 5-191.000.

Marquez, Joseph A.: *See*—
Weinstein, Marvin J.; Wagman, Gerald H.; Marquez, Joseph A.; and Patel, Mahesh G., 4,223,130, Cl. 536-17.00R.

Marriott, Eric W.: *See*—
Strong, Barry C.; Marriott, Eric W.; and Clayton, William, 4,222,248, Cl. 66-82.00R.

Marshall, John T.: *See*—
Sholl, Howard A.; and Marshall, John T., 4,222,275, Cl. 73-636.000.

Marshman, Joan A.: *See*—
Hsia, Jen C.; Le Blanc, Arthur E.; and Marshman, Joan A., 4,223,004, Cl. 424-9.000.

Marti, Heinrich; and Fluckiger, Friedrich, to Concast AG. Guide roller for continuous casting installations. 4,222,433, Cl. 164-448.000.

Martin, Henry, to Ciba-Geigy Corporation. Quaternary ammonioalkanecarboxylic acid anilides as plant growth influencing agents. 4,222,766, Cl. 71-95.000.

Martin Marietta Corporation: *See*—
Layne, Charles R., 4,222,667, Cl. 356-346.000.

Martindale, Troy E., to B. F. Goodrich Company, The. Tire bundling machine. 4,222,323, Cl. 100-12.000.

Martinez, Miguel. In vivo illumination system utilizing a cannula with a conical opening allowing a snap-fit with a conical lens and an aperture for flow of fluids and utilizing a housing with a spherical lens for focusing light onto fiber optics. 4,222,375, Cl. 128-23.000.

Martins, Joseph G.: *See*—
Donermeyer, Donald D.; and Martins, Joseph G., 4,222,976, Cl. 264-36.000.

Marubeni Corporation: *See*—
Se, Tsuneyuki, 4,223,044, Cl. 426-318.000.

Marui, Masatoshi: *See*—
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,222,394, Cl. 128-773.000.

Maruyama Seiki Kabushiki Kaisha: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.

Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, to Bridgestone Tire Company Limited; and Maruyama Seiki Kabushiki Kaisha. Method and apparatus for assembling tire with disc wheel. 4,223,386, Cl. 364-506.000.

Marvel Engineering Company: *See*—
Hocking, Guy E., 4,223,302, Cl. 340-525.000.

Masaki, Akio: *See*—
Agatahama, Shunichi; Masaki, Akio; and Bando, Yoshihide, 4,223,290, Cl. 335-229.000.

Masaki, Katsumi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.

Masaoka, Isao: *See*—
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yositeru; and Kuniya, Jiro, 4,223,197, Cl. 219-61.700.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Lindner, Horst, 4,222,430, Cl. 164-61.000.

Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,223,139, Cl. 544-171.000.

Mason, George W., to General Motors Corporation. Vane area measuring device. 4,222,172, Cl. 33-174.00C.

Mason, Ronald F.; and Devlin, Barry R. J., to Shell Oil Company. 3-Azabicyclo(3.1.0)hexane-2-carbonitrile. 4,222,936, Cl. 260-326.620.

Mason, Ronald M. Apparatus for curing photo-developing inks. 4,222,177, Cl. 34-4.000.

Massachusetts Institute of Technology: *See*—
Antonsson, Erik K.; and Flowers, Woodie C., 4,222,382, Cl. 128-303.00R.

Masui, Yasuyuki, to Kabushiki Kaisha Daini Seikosha. Waterproofed watchcase construction. 4,222,228, Cl. 368-291.000.

Masumoto, Hiroki: *See*—
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, 4,222,772, Cl. 75-124.000.

Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge pumping semiconductor memory. 4,223,333, Cl. 357-41.000.

Masyc AG: *See*—
Gunti, Rolf, 4,222,461, Cl. 187-20.000.

Matera, Giancarlo: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,223,108, Cl. 525-212.000.

Mathematical Sciences Northwest, Inc.: *See*—
Bradford, Robert S., Jr.; Braverman, Leonard W.; and Levatter, Jeffrey I., 4,223,279, Cl. 331-94.5PE.

Mathes, Josef; and Melzer, Rudolf, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Mechanism for controlling and smoothing a conveyed sheet in a multi-color printing press particularly applicable to printing in the verso mode. 4,222,326, Cl. 101-183.000.

Matsubara, Masaka; Ishihara. Tatsuo; and Mori, Tokitaka, to Matsubara, Masaka. Composition for treating skin diseases. 4,223,015, Cl. 424-95.000.

Matsufuji, Yohji, to Canon Kabushiki Kaisha. Liquid crystal composition. 4,222,887, Cl. 252-299.000.

Matsumoto, Haruo: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,223,287, Cl. 333-206.000.

Matsunaga, Teruo: *See*—
Kawamura, Takeo; and Matsunaga, Teruo, 4,222,928, Cl. 260-40.00R.

Matsuno, Tadahiko: *See*—
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,222,522, Cl. 239-160.000.

Matsuoka, Hideoki: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ono, Shusuke; Ohji, Kenzo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,223,286, Cl. 333-195.000.
Yamamori, Kiyoshi; and Mizoguchi, Akira, 4,223,324, Cl. 346-140.00R.

Matteo, George W., Sr. Highway guardrail cover. 4,222,552, Cl. 256-13.100.

Matthew, John B.: *See*—
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,222,817, Cl. 162-4.000.

Matthews, Charles W., to Gulf Research & Development Company. Process for retorting oil shale. 4,222,850, Cl. 208-11.00R.

Mauer, John L., IV: *See*—
Lever, Reginald F.; Mauer, John L., IV; Michel, Alwin E.; and Rothman, Laura B., 4,222,792, Cl. 148-1.500.

Maury, Louis, to Societe E. Lacroix. Decoy-launching packs for foiling guided weapon systems. 4,222,306, Cl. 89-1.00L.

Max-Planck-Gesellschaft zur Foerderung der Wissenschafter e.V.: *See*—
Hofer, Wolfgang O.; Kirschner, Jurgen; and Thum, Franz, 4,223,223, Cl. 250-397.000.

Mayer, Eugene P.: *See*—
Teodorescu, Marius C.; Mayer, Eugene P.; and Dray, Sheldon, 4,223,005, Cl. 424-12.000.

Mayer, Thomas J., to I^2DS. Sump pump control system. 4,222,711, Cl. 417-7.000.

Mazza, John C., to American Hospital Supply Corporation. Reagents for the enzymatic determination of triglycerides. 4,223,090, Cl. 435-19.000.

Mazzone, Jean-Pierre: *See*—
Dauguet, Jean-Claude; Mazzone, Jean-Pierre; and Moreau, Pierre, 4,222,747, Cl. 51-301.000.

MCA Discovision, Inc.: *See*—
Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,223,349, Cl. 358-128.500.

McAlpin, James J.: *See*—
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., 4,222,986, Cl. 422-131.000.

McAlpine, James B.; and DeVault, Robert L., to Abbott Laboratories. 4''-O-Alkylgentamicins and sagamicins. 4,223,024, Cl. 424-180.000.

McCarthy, James R. Apparatus for separating selected particulate materials from a mixture of solids and liquids. 4,222,857, Cl. 209-9.000.

McConnell, Harden M., to Becton Dickinson & Company. Assay for ligands. 4,222,744, Cl. 23-230.00B.

McCray, Philip C.; and Hammond, George B., to Kershaw Manufacturing Company, Inc. Apparatus for mounting flail members on a rotatable drum. 4,222,418, Cl. 144-2.00Z.

McCulloch, Gary E. Apparatus for obtaining energy from wave motion. 4,222,238, Cl. 60-398.000.

McDermott, Richard P., to WSP Industries Corporation. Warm forging of connecting rod caps. 4,222,260, Cl. 72-345.000.

McFarland, Keith E.: *See*—
Lloyd, William A.; Wong, Herman; and McFarland, Keith E., 4,222,497, Cl. 222-57.000.

McGraw-Edison Company: *See*—
Moran, Richard J., 4,223,365, Cl. 361-71.000.

McKee, James A., to Canadian Fishing Co. Ltd., The. Apparatus for extracting fish roe. 4,222,151, Cl. 17-52.000.

McKeon, Thomas M.: *See*—
Horton, Anthony; McKeon, Thomas M.; and Preston, Jack, 4,223,206, Cl. 219-374.000.

McLauchlan, Thomas A.: *See*—
Walser, Donald C.; and McLauchlan, Thomas A., 4,222,421, Cl. 144-325.000.

McLean, Michael E.; Ensley, Rufus N.; Alcaraz, Anthony J.; and Caldwell, Paul E., to Dayco Corporation. Apparatus for and method of removing scrap ribbons trimmed from a carpeting strip. 4,222,809, Cl. 156-267.000.

McMaster, Harold A. Gas jet pump, and apparatus using same. 4,222,763, Cl. 65-287.000.

McMillin, Danny L.: *See*—
Dugan, Larry M.; and McMillin, Danny L., 4,222,479, Cl. 198-482.000.

McNeil Akron, Inc.: *See*—
Bibbee, Jeffrey N.; and Smith, Thomas W., 4,223,213, Cl. 235-92.00T.

McNeil Corporation: *See*—
Slemmons, Charles O., 4,223,402, Cl. 368-238.000.

McQueston, James C.; and Bauer, Horace P., to Budd Company, The. Means for manufacturing a modular railway car. 4,222,335, Cl. 105-397.000.

Mead Corporation, The: *See*—
Kasper, Klaus B.; and Hill, John A., III, 4,222,973, Cl. 264-22.000.
Kenworthy, E. J. Doyle, 4,223,321, Cl. 346-75.000.
Paranjpe, Suresh C.; and Donahue, John W., 4,223,320, Cl. 346-75.000.

Mead Johnson & Company: *See*—
Covington, Robert R.; Temple, Davis L., Jr.; and Yevich, Joseph P., 4,223,031, Cl. 424-251.000.

Mechanical Technology Incorporated: *See*—
Miller, William H., Jr., 4,222,618, Cl. 308-9.000.

Meckler, Gershon, to Gershon Meckler Associates, P.C. Air conditioning apparatus utilizing solar energy and method. 4,222,244, Cl. 62-2.000.

Medlock, Charles: *See*—
Medlock, Curtis M., 4,222,859, Cl. 209-143.000.

Medlock, Curtis M., to Medlock, Charles. Particle separator devices. 4,222,859, Cl. 209-143.000.

Medtronic, Inc.: *See*—
Phillips, Gary M.; and Untereker, Darrel F., 4,223,110, Cl. 525-356.000.

Meier, Helmut: *See*—
Ernsberger, Klaus; and Meier, Helmut, 4,223,259, Cl. 318-648.000.

Meins, Peter; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). 13-Oxabicyclo[10.3.0]pentadecane, its preparation and use in perfume compositions and as an odorant. 4,222,904, Cl. 252-522.00R.

Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Tandem wheel proportioning arrangement. 4,222,578, Cl. 280-6.110.

Meixner, Hans: *See*—
Kleinschmidt, Peter; and Meixner, Hans, 4,223,208, Cl. 219-530.000.

Meixner, Rudolf: *See*—
Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, 4,222,603, Cl. 296-146.000.

Melcher, Leland J. Irrigation machine. 4,222,520, Cl. 239-70.000.

Melzer, Rudolf: *See*—
Mathes, Josef; and Melzer, Rudolf, 4,222,326, Cl. 101-183.000.

Merrill, Stewart H.; and Santilli, Domenic, to Eastman Kodak Company. Electrostatic process using liquid developer comprising polymeric phosphonate dispersant. 4,223,086, Cl. 430-119.000.

Metabio Joullie: *See*—
Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, 4,223,039, Cl. 424-275.000.

Metal Bellows Corporation: *See*—
Sampson, Edward J.; and Prosl, Frank R., 4,222,374, Cl. 128-1.00R.

Metzeler Schaum GmbH: *See*—
Bokelmann, Horst, 4,222,722, Cl. 425-89.000.

Metzger, Karl G.: *See*—
Preiss, Michael; and Metzger, Karl G., 4,223,037, Cl. 424-271.000.

Meyer, Rolf-Volker; Dhein, Rolf; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polyamides from 2,4'-diaminodicyclohexyl methane. 4,223,127, Cl. 528-324.000.

Meyers, F. D.: *See*—
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,222,757, Cl. 65-2.000.

Meyers, Theodore J.: *See*—
Parssinen, Edwin J.; and Meyers, Theodore J., 4,223,401, Cl. 367-168.000.

Michaels, Alan S., to ALZA Corporation. Hydrophilic laminate useful for making dispensing device. 4,223,061, Cl. 428-215.000.

Michel, Alwin E.: *See*—
Lever, Reginald F.; Mauer, John L., IV; Michel, Alwin E.; and Rothman, Laura B., 4,222,792, Cl. 148-1.500.

Michel, Walter: *See*—
Honel, Hans; Keller, Karlfried; Michel, Walter; and Schon, Manfred, 4,223,141, Cl. 544-196.000.

Michelau, Fredrick: *See*—
Tonelli, Roger; and Michelau, Fredrick, 4,222,582, Cl. 280-87.02R.

Microwave Semiconductor Corp.: *See*—
Thompson, James W., 4,223,336, Cl. 357-63.000.

Midland-Ross Corporation: *See*—
Moran, Thomas L., 4,222,178, Cl. 34-41.000.

Midway Mfg. Co.: *See*—
Eme, Robert, deceased; and Schuman, Lloyd P., 4,222,624, Cl. 339-91.00R.

Milberger, Ernest C.: *See*—
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,223,161, Cl. 562-534.000.

Miller, Donald K. Adaptive servo control system. 4,223,257, Cl. 318-594.000.

Miller, Donald W. Pressure fed roller type fluid applicator. 4,222,678, Cl. 401-218.000.

Miller, John J., to Alumax Inc. Hall cell. 4,222,841, Cl. 204-247.000.

Miller, Robert H.: *See*—
DeKeyser, Richard A.; and Miller, Robert H., 4,222,713, Cl. 417-214.000.

Miller, William H., Jr., to Mechanical Technology Incorporated. Compliant hydrodynamic fluid bearing with resilient support matrix. 4,222,618, Cl. 308-9.000.

Miller, William R.; and Peck, Clarence E., to Westinghouse Electric Corp. Control of workpiece heating. 4,223,385, Cl. 364-472.000.

Milliken Research Corporation: *See*—
Engels, Walter, 4,222,158, Cl. 26-16.000.

Millipore Corporation: *See*—
Sternberg, Shmuel; and Emmer, Steven S., 4,222,870, Cl. 210-639.000.

Millner, Ozra E., Jr.: *See*—
Alaimo, Robert J.; Sheffer, James B.; and Millner, Ozra E., Jr., 4,222,948, Cl. 260-397.70R.

Mills, Robert G. Suction cleaner. 4,222,753, Cl. 55-274.000.

Milsco Manufacturing Company: *See*—
Eimen, Shawn H., 4,222,555, Cl. 267-131.000.

Minagawa, Motonobu; Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. Stabilizers for synthetic polymers comprising 2,2,6,6-tetramethyl-4-piperidyl ether alcohol or ether, phosphonic acid ester and phenolic antioxidant. 4,222,931, Cl. 260-45.8NZ.

Miner, Carla J.: *See*—
Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., 4,223,308, Cl. 340-719.000.

Ministry of International Trade & Industry: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.

Minnesota Mining and Manufacturing Company: *See*—
Abel, Allen J., 4,222,487, Cl. 206-444.000.
Boston, David R., 4,223,087, Cl. 430-302.000.
Caldwell, Donald B.; and Gardeski, Thomas F., 4,223,073, Cl. 428-422.000.
Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., 4,222,902, Cl. 252-500.000.
Levens, Dennis L., 4,223,067, Cl. 428-308.000.

Minolta Camera Kabushiki Kaisha: *See*—
Imura, Toshinori; and Tanaka, Harumi, 4,222,645, Cl. 354-51.000.
Niwa, Masatake; Inoue, Norihiro; Kawamura, Kunio; and Beppu, Norio, 4,222,649, Cl. 354-173.000.

Mirring, Knut, to SKF Industries, Inc. Cage for a rolling bearing made of synthetic material. 4,222,620, Cl. 308-217.000.

Mischenko, Olga I.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.

Misumi, Akira; and Kumada, Masaharu, to Hitachi, Ltd. Base metal plate materials for directly heated oxide cathodes. 4,222,775, Cl. 75-170.000.

Mita, Hirosi: *See*—
Maruyama, Yuji; Mita, Hirosi; Fukuyama, Hiroshi; Haraguchi, Yoshifumi; and Aramaki, Seiichi, 4,223,386, Cl. 364-506.000.

Mitchell, Don E.: *See*—
Dassele, Michael A.; Kush, Stephen T.; and Mitchell, Don E., 4,222,629, Cl. 350-96.200.

Mitsubishi Chemical Industries Limited: *See*—
Imada, Yukio; and Takahashi, Katsuhiko, 4,223,091, Cl. 435-55.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,223,327, Cl. 357-15.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Goi, Yoshihiro; and Kamiharako, Shozo, 4,222,587, Cl. 280-804.000.
Kumagai, Naotake, 4,222,435, Cl. 165-11.00R.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, 4,222,771, Cl. 75-124.000.

Miyake, Makoto: *See*—
Okimoto, Tomoyuki; Shiozaki, Tomoharu; and Miyake, Makoto, 4,222,891, Cl. 252-316.000.

Miyake, Yoshizo: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.

Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,222,659, Cl. 355-14.00R.

Miyamoto, Yukihiko: *See*—
Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,223,237, Cl. 307-268.000.

Miyao, Hidetoshi: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.

Miyata, Hiroyasu: *See*—
Iwasaki, Sadayoshi; and Miyata, Hiroyasu, 4,223,193, Cl. 200-308.000.

Miyata, Kenji: *See*—
Terasawa, Yoshio; Miyata, Kenji; Naito, Masayoshi; Ogawa, Takuzo; and Okamura, Masahiro, 4,223,328, Cl. 357-22.000.

Miyatake, Osamu; Murakami, Hirotake; and Hishinuma, Masakatsu, to Fuji Electric Co., Ltd. Multi-range timer. 4,222,226, Cl. 368-113.000.

Miyoshi, Yasuhiko: *See*—
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, 4,222,772, Cl. 75-124.000.

Mizelle, Ned W., to Hoover Universal, Inc. Bed frame with improved leg supports. 4,222,135, Cl. 5-310.000.

Mizoguchi, Akira: *See*—
Yamamori, Kiyoshi; and Mizoguchi, Akira, 4,223,324, Cl. 346-140.00R.

Mizote, Masanori: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Mizudani, Tomihiko: *See*—
Tsuda, Eiichi; and Mizudani, Tomihiko, 4,223,052, Cl. 428-31.000.

Mizuno, Shioji; and Enokimoto, Norio, to Dainippon Ink & Chemicals, Inc. Flame-retardant thermoplastic polyester resin compositions. 4,222,926, Cl. 260-40.00R.

Mizushima, Kunio: *See*—
Zaitsu, Hiroshi; Yamase, Takashi; Yamashita, Sadao; and Mizushima, Kunio, 4,223,361, Cl. 360-133.000.

Mo och Domsjo Aktiebolag: *See*—
Fossum, Greta K.; and Haggstrom, Sten L., 4,222,819, Cl. 162-76.000.

Mobay Chemical Corporation: *See*—
Reinert, Gerard E., 4,223,100, Cl. 525-146.000.

Mobil Oil Corporation: *See*—
Byham, Don E.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,222,881, Cl. 252-8.55D.
Pelrine, Bruce P.; and Chen, Nai Y., 4,222,855, Cl. 208-111.000.
Rollmann, Louis D., 4,222,897, Cl. 252-439.000.

Mobsby, John A., to Rolls-Royce Limited. Fuel burners for gas turbine engines. 4,222,243, Cl. 60-742.000.

Moczygemba, George A.; and Hsieh, Henry L., to Phillips Petroleum Company. Conjugated diene polymerization process and catalyst. 4,223,116, Cl. 526-117.000.

Moder, Helmut: *See*—
Drews, Ulrich; Werner, Peter; Moder, Helmut; and Kugelmann, Adolf, 4,222,352, Cl. 123-484.000.

Modern Precision Engineers and Associates Limited: *See*—
Clements, Harold J., 4,222,576, Cl. 277-237.00R.

Moe, Richard G., to Allis-Chalmers Corporation. Floating drive gear for crop harvesting apparatus. 4,222,218, Cl. 56-104.000.

Moeller, Douglas E., to Sun Trac Corporation. Sun-tracking solar energy conversion system. 4,223,174, Cl. 136-246.000.

Moench, Clauspeter; Scheffels, Wilhelm; Konig, Dieter; and Steigerwald, Karl H., to Steigerwald Strahltechnik G.m.b.H. Charged particle beam processing with magnetic field compensation. 4,223,200, Cl. 219-121.0EB.

Moench, Theodor P.: *See*—
Hanstein, Friedrich; and Moench, Theodor P., 4,222,210, Cl. 52-461.000.

Moenne-Loccoz, Jean-Marc: *See*—
Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,350, Cl. 358-139.000.
Tsujimura, Katsuhito; Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,351, Cl. 358-182.000.

Moffitt, Jerry T.; and Bulgrin, Robert W., to Allen-Bradley Company. Vernier control. 4,223,294, Cl. 338-122.000.

Moggio, William A.: *See*—
Bohrn, Walter J.; and Moggio, William A., 4,222,740, Cl. 8-448.000.

Mogi, Takaaki: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Mohawk Industries, Inc.: *See*—
Leavens, Richard; and Evans, Arthur D., 4,222,363, Cl. 126-77.000.

Molat, Joseph H. Electrically operated bingo device for sighted and sight disadvantaged people. 4,222,571, Cl. 273-237.000.

Molby, Lloyd A. Adaptable combination of vehicle and attachments. 4,222,186, Cl. 37-86.000.

Mold-Masters Limited: *See*—
Gellert, Jobst U.; and Krause, Peter, 4,222,733, Cl. 425-566.000.

Molins, Desmond W.; and Hinchcliffe, Dennis, to Molins Limited. Reservoir for cigarettes and like articles. 4,222,477, Cl. 198-347.000.

Molins Limited: *See*—
Molins, Desmond W.; and Hinchcliffe, Dennis, 4,222,477, Cl. 198-347.000.

Moller, Hermann: *See*—
Breitschwerdt, Werner; Gotz, Hans; Meixner, Rudolf; Andres, Rudolf; and Moller, Hermann, 4,222,603, Cl. 296-146.000.

Molnlycke AB: *See*—
Widlund, Leif U. R.; and Strandberg, Kerstin A. H., 4,222,381, Cl. 128-270.000.

Momany, Frank A., to Beckman Instruments, Inc. Synthetic peptides having pituitary growth hormone releasing activity. 4,223,019, Cl. 424-177.000.

Momany, Frank A., to Beckman Instruments, Inc. Synthetic peptides having pituitary growth hormone releasing activity. 4,223,020, Cl. 424-177.000.

Momany, Frank A., to Beckman Instruments, Inc. Synthetic peptides having pituitary growth hormone releasing activity. 4,223,021, Cl. 424-177.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,222,327, Cl. 101-288.000.

Monogram Industries, Inc: *See*—
Rod, Robert L., 4,223,317, Cl. 343-803.000.

Monsanto Company: *See*—
Argo, Wesley B.; Crocker, Burton B.; and Sisler, Charles C., 4,222,748, Cl. 55-6.000.
Crutchfield, Marvin M.; Lannert, Kent P.; and Upton, Charles J., 4,223,162, Cl. 562-583.000.
D'Amico, John J., 4,222,938, Cl. 260-239.00A.
Dobo, Emerick J., 4,222,977, Cl. 264-63.000.

Donermeyer, Donald D.; and Martins, Joseph G., 4,222,976, Cl. 264-36.000.
Hedrick, Ross M.; and Gabbert, James D., 4,223,112, Cl. 525-432.000.
Lee, Yoon C.; and Trementozzi, Quirino A., 4,223,096, Cl. 525-74.000.
Liu, Kou-Chang; and Howe, Robert K., 4,223,154, Cl. 548-248.000.
Rademacher, Leo E., 4,222,932, Cl. 260-45.9KB.
Van Eenam, Donald N., 4,222,921, Cl. 260-29.60H.

Montanari, Roberto. Process for producing phosphonomycin. 4,222,970, Cl. 260-968.000.

Mookherjee, Braja D.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.

Moran, Richard J., to McGraw-Edison Company. Auto resetting switchgear trip indicator circuits. 4,223,365, Cl. 361-71.000.

Moran, Thomas L., to Midland-Ross Corporation. Method and apparatus for controlling a drying cylinder. 4,222,178, Cl. 34-41.000.

Morbitzer, Leo: *See*—
von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

Moreau, Pierre: *See*—
Dauguet, Jean-Claude; Mazzone, Jean-Pierre; and Moreau, Pierre, 4,222,747, Cl. 51-301.000.

Mori, Fumio: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.

Mori, Masahiko; Hanaoka, Seiji; and Kobayashi, Takao, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Head portion of a dot printer. 4,222,674, Cl. 400-124.000.

Mori, Tokitaka: *See*—
Matsubara, Masaka; Ishihara, Tatsuo; and Mori, Tokitaka, 4,223,015, Cl. 424-95.000.

Morikawa, Juichi; and Kotera, Nobuo, to Hitachi, Ltd. Hall element. 4,223,292, Cl. 338-32.00H.

Morinaga, Hiroshi: *See*—
Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; and Kawahara, Masao, 4,223,118, Cl. 526-128.000.

Morita, Akira: *See*—
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,222,522, Cl. 239-160.000.

Moriya, Michio; and Nishiyama, Yukinori, to Sumitomo Electric Industries, Ltd. Disc brake apparatus for a motor vehicle. 4,222,464, Cl. 188-73.300.

Morrell, Roger J.: *See*—
Larson, William C.; and Morrell, Roger J., 4,222,611, Cl. 299-4.000.

Morse, David L.; and Seward, Thomas P., III, to Corning Glass Works. Optically clear copper halide photochromic glass articles. 4,222,781, Cl. 106-47.00Q.

Morton-Norwich Products, Inc.: *See*—
Alaimo, Robert J.; Sheffer, James B.; and Millner, Ozra E., Jr., 4,222,948, Cl. 260-397.70R.

Moseley, Thomas S. Fluid flow transfer. 4,222,242, Cl. 60-698.000.

Moser, Kenneth B.: *See*—
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., 4,223,129, Cl. 536-4.000.

Moses, P. R.: *See*—
Murray, Royce W.; Moses, P. R.; and Wier, Larry, 4,223,049, Cl. 427-126.000.

Moss, Gerald, to Exxon Research & Engineering Co. Removing particles from a particle-containing fluid. 4,222,749, Cl. 55-18.000.

Moss, Philip H.: *See*—
Watts, Lewis W., Jr.; Brader, Walter H., Jr.; Moss, Philip H.; and Yeakey, Ernest L., 4,222,957, Cl. 260-512.00R.

Mossberg Hubbard, Division of Wanskuck Company: *See*—
Hosbein, Hugh W., 4,222,535, Cl. 242-128.000.

Mostmans, Joseph H.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,223,036, Cl. 424-269.000.

Motojima, Kenji; Tachikawa, Enzo; and Kamiyama, Hideo, to Japan Atomic Energy Research Institute. Process for preparing oxine impregnated-activated charcoal. 4,222,892, Cl. 252-428.000.

Motonami, Masanao: *See*—
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,222,588, Cl. 280-804.000.

Motorola, Inc.: *See*—
Davidson, Allen L.; Arnold, Pitt W.; and Stern, Morton, 4,223,310, Cl. 343-100.0CS.
Goodner, Willis R.; and Kao, Joseph P. Y., 4,222,839, Cl. 204-192.00E.
Parkinson, Ward D.; and Seelbach, Walter C., 4,223,238, Cl. 307-297.000.
Santis, Dean C.; and Sievers, Kirk, 4,223,363, Cl. 361-18.000.

Mouille, Rene L., to Societe Nationale Industrielle Aerospatiale. Variable-pitch rotor, specially for a rotary-wing aircraft. 4,222,709, Cl. 416-134.00A.

Moutet, Louis; and Moenne-Loccoz, Jean-Marc, to Thomson-CSF. Diascope for a television camera. 4,223,350, Cl. 358-139.000.

Moutet, Louis: *See*—
Tsujimura, Katsuhito; Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,351, Cl. 358-182.000.

Mower, Lawrence N.: *See*—
Hollingsworth, Frank H.; and Mower, Lawrence N., 4,222,438, Cl. 166-250.000.

Mozhaev, Arkady I.: *See*—
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.

Muchel, Franz, to Carl Zeiss Stiftung. Wide angle objective for examination of the eye. 4,222,634, Cl. 350-189.000.

Mueller, Norman P.; Rossi, Charles E.; and Scherpereel, Lawrence R., to Westinghouse Electric Corp. Method for operating a nuclear reactor to accommodate load follow while maintaining a substantially constant axial power distribution. 4,222,822, Cl. 176-20.00R.

Muller, Elmar; and Weimann, Klaus, to BBC Brown, Boveri & Company, Limited. Thyristor with two control terminals and control device. 4,223,331, Cl. 357-38.000.

Muller, Heinz: *See*—
Esser, Heinz; Illger, Hans W.; Muller, Heinz; Kost, Willi; and Gonzalez-Dorner, Alberto C., 4,223,095, Cl. 521-55.000.

Muller, John J.: *See*—
Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., 4,222,808, Cl. 156-245.000.

Muller, Pierre: *See*—
Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, 4,223,039, Cl. 424-275.000.

Muller, Wolfgang H. E.: *See*—
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 201-2.500.

Murakami, Hirotake: *See*—
Miyatake, Osamu; Murakami, Hirotake; and Hishinuma, Masakatsu, 4,222,226, Cl. 368-113.000.

Murakami, Katsumi: *See*—
Furuichi, Katsushi; Honma, Toshio; and Murakami, Katsumi, 4,222,660, Cl. 355-14.00R.

Murata Manufacturing Co., Ltd.: *See*—
Inoue, Atsushi; Yamada, Hiromichi; and Suzuki, Kenji, 4,223,284, Cl. 333-150.000.
Nakamura, Takeshi, 4,223,177, Cl. 174-52.00S.
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,223,287, Cl. 333-206.000.

Murata, Tomomi: *See*—
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, 4,222,772, Cl. 75-124.000.

Murphy, Michael P.; and Hillebrand, George W., to General Motors Corporation. Heated solid electrolyte oxygen sensor. 4,222,840, Cl. 204-195.00S.

Murphy, Patrick J., Jr. Conical roller chain indexing device. 4,222,291, Cl. 74-813.00R.

Murray, Royce W.; Moses, P. R.; and Wier, Larry, to Research Triangle Institute. Superficially mixed metal oxide electrodes. 4,223,049, Cl. 427-126.000.

Murtaugh, William J.: *See*—
Butte, Walter A., Jr.; Murtaugh, William J.; and Angstadt, Howard P., 4,222,961, Cl. 260-563.00D.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Flavoring with carvyl methyl ether. 4,223,046, Cl. 426-538.000.

Muzzarelli, Gabriele. Device for the flocculation of albumin from whey material. 4,222,321, Cl. 99-458.000.

Myers, Harry K., Jr.; and Schneider, Abraham, to Suntech, Inc. Isomerization of endo-endo hexacyclic olefinic dimer of norbornadiene. 4,222,800, Cl. 149-109.600.

Myers, William H. Pouring spout attachment for a container. 4,222,503, Cl. 222-508.000.

Mylenek, Chester, to Ford Motor Company. Single shift rail manual transmission with overdrive speed ratio. 4,222,281, Cl. 74-339.000.

Nagai, Shohei: *See*—
Oinoue, Kenichi; and Nagai, Shohei, 4,223,348, Cl. 358-128.500.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage follower circuit. 4,223,276, Cl. 330-257.000.

Nagao, Yoshio: *See*—
Hashimoto, Takeji; Nagao, Yoshio; and Doi, Yasushi, 4,222,247, Cl. 66-75.200.

Nagaoka, Tadahiko: *See*—
Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, 4,222,351, Cl. 123-3.000.

Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. System for processing a waveform for a larynx stroboscope. 4,222,394, Cl. 128-773.000.

Nagashima, Takashi: *See*—
Takeshita, Hiroshi; Nagashima, Takashi; and Kondo, Hiroyuki, 4,222,613, Cl. 303-6.00C.

Nagata, Hidetoshi: *See*—
Yoshida, Risaburo; Nagata, Hidetoshi; Naito, Michihisa; and Kaiho, Keisuke, 4,223,074, Cl. 428-469.000.
Nagata, Wataru: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.
Nagy, Laszlo, to General Motors Corporation. Manual transmission lubrication system. 4,222,283, Cl. 74-467.000.
Nagy, Louis E.: *See*—
Rawson, Paul O.; Nagy, Louis E.; and Veth, George J., 4,222,391, Cl. 128-736.000.
Naito, Masayoshi: *See*—
Terasawa, Yoshio; Miyata, Kenji; Naito, Masayoshi; Ogawa, Takuzo; and Okamura, Masahiro, 4,223,328, Cl. 357-22.000.
Naito, Michihisa: *See*—
Yoshida, Risaburo; Nagata, Hidetoshi; Naito, Michihisa; and Kaiho, Keisuke, 4,223,074, Cl. 428-469.000.
Nakagawa, Kazuyuki: *See*—
Yoshizaki, Shiro; Tamada, Shigeharu; Yo, Eiyu; and Nakagawa, Kazuyuki, 4,223,137, Cl. 544-128.000.
Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,222,931, Cl. 260-45.8NZ.
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, to Fuji Photo Film Co., Ltd. Process for forming color images. 4,222,777, Cl. 430-363.000.
Nakamura, Shuji, to Tokyo Aircraft Instrument Co., Ltd. Gyro apparatus using viscous damping device. 4,222,278, Cl. 74-5.500.
Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Structure and method for sealing electronic parts. 4,223,177, Cl. 174-52.00S.
Nakane, Masanori: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.
Nakane, Takeshi: *See*—
Kawarada, Osamu; Nakane, Takeshi; and Kondo, Isao, 4,222,647, Cl. 354-145.000.
Nakano, Motokiyo: *See*—
Ikeda, Toshihide; Kobayashi, Toshiaki; Nakano, Motokiyo; and Tanaka, Chiaki, 4,222,908, Cl. 260-16.000.
Nakano, Takashi: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.
Nalco Chemical Company: *See*—
Finch, Robert E., 4,222,861, Cl. 209-166.000.
Finch, Robert E., 4,222,862, Cl. 209-166.000.
Napolitano, Alex; and Napolitano, Dennis M. Tree tie. 4,222,198, Cl. 47-43.000.
Napolitano, Dennis M.: *See*—
Napolitano, Alex; and Napolitano, Dennis M., 4,222,198, Cl. 47-43.000.
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Nickel-palladium Schottky junction in a cavity. 4,223,327, Cl. 357-15.000.
Narahara, Toshikazu: *See*—
Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, 4,222,802, Cl. 156-53.000.
Natarov, Alexandr P.: *See*—
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.
National Gypsum Company: *See*—
Pearson, Robert J., 4,222,211, Cl. 52-741.000.
National Research Development Corporation: *See*—
Backhouse, Richard J., 4,222,385, Cl. 128-419.0PG.
Crisp, Stephen; and Wilson, Alan D., 4,222,920, Cl. 260-29.60M.
NCR Corporation: *See*—
Antonaccio, Joseph C.; and Verreau, Bernard J., 4,223,380, Cl. 364-200.000.
Bader, Leonhard; Giessner, Frank; and Weber, Helmut, 4,223,323, Cl. 346-140.00R.
Negishi, Masataka. Heat engine. 4,222,239, Cl. 60-527.000.
Neiheisel, Gary L.; and Hoover, Bradley R., to Armco Inc. Automatic defect detecting inspection apparatus. 4,223,346, Cl. 358-106.000.
Nelson, David H.: *See*—
Dorian, Mark E.; and Nelson, David H., 4,223,214, Cl. 250-203.00R.
Nelson, David L.: *See*—
Bowers, Earl Q.; and Nelson, David L., 4,223,390, Cl. 364-900.000.
Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Heather yarn made from bulked continuous-filament yarns. 4,222,223, Cl. 57-246.000.
Nemoto, Toshio: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.
Neturen Company, Ltd.: *See*—
Hijikata, Toshio; Yamazaki, Takao; and Fujita, Kiyohiko, 4,222,799, Cl. 148-143.000.
Neuman, Richard F.: *See*—
Garrett, Wayne H.; and Neuman, Richard F., 4,222,310, Cl. 92-128.000.
Newman, Edward S., to Hoffmann-La Roche Inc. Isolation of alpha$_1$-fetoprotein. 4,223,002, Cl. 424-1.000.
Newman, Howard F.; and King, David L., to Precision Dynamics Corporation. Culture collection and transport device. 4,223,093, Cl. 435-295.000.
Newman, Timothy L. Truck mounted railroad crane main bed frame. 4,222,332, Cl. 105-215.00C.
NGK Insulators, Ltd.: *See*—
Atsumi, Senji; and Wada, Shigetaka, 4,222,783, Cl. 106-73.320.
Oda, Isao; and Maekawa, Koichiro, 4,222,978, Cl. 264-65.000.
Nguyen, Tinh H.: *See*—
Dubois, Jean-Claude; Nguyen, Tinh H.; and Zann, Annie, 4,222,888, Cl. 252-299.000.
Nichols, Donald K.: *See*—
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Nicolson, Ian T.: *See*—
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Niederrheinische Maschinenfabrik Becker & van Hullen: *See*—
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Nield, Gerald L.: *See*—
Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., 4,223,164, Cl. 568-618.000.
Nield, James M., to Diamond International Corporation. Starter-grower cage. 4,222,348, Cl. 119-17.000.
Nielsen, Gert, to Gerni A/S. Apparatus for cleaning objects by means of a jet of liquid. 4,222,521, Cl. 239-135.000.
Niemeier, Gerd, to Daimler-Benz Aktiengesellschaft. Injection pump, especially for motor vehicles. 4,222,359, Cl. 123-366.000.
Nifco Inc.: *See*—
Yoshida, Kosaku; and Hara, Kunio, 4,222,304, Cl. 85-71.000.
Nihon Bed Manufacturing Company, Ltd.: *See*—
Usami, Nobuo, 4,222,137, Cl. 5-446.000.
Nikiforov, Vladimir A.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.
Nikitina, Tatyana I.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.
Nikonov, Vladimir Z.: *See*—
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.
Niles Parts Co., Ltd.: *See*—
Shimizu, Akio, 4,223,268, Cl. 328-48.000.
Nilsson, Sven W., to SKF Nova AB. Device for transforming a rotational movement into a linear movement. 4,222,619, Cl. 308-176.000.
Nippon Electric Co., Ltd.: *See*—
Kojima, Hideto; and Funakoshi, Hisashi, 4,223,337, Cl. 357-68.000.
Tachizawa, Hiroshi; and Kawano, Asaji, 4,222,665, Cl. 356-218.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,223,273, Cl. 330-85.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sekiguchi, Yoshikazu; and Asano, Kenji, 4,222,575, Cl. 277-59.000.
Nippon Soken, Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,222,237, Cl. 60-276.000.
Nippon Steel Corporation: *See*—
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, 4,222,772, Cl. 75-124.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Hattori, Takeshi; and Hirade, Kenkichi, 4,223,405, Cl. 455-105.000.
Nippondenso Co., Ltd.: *See*—
Ota, Isamu; and Abe, Toshihito, 4,222,357, Cl. 123-568.000.
Nippondenso Kabushiki Kaisha: *See*—
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.
Nishida, Kazuhiko: *See*—
Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, 4,222,771, Cl. 75-124.000.
Nishida, Takashi: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.
Nishikawa, Mineki; Kakegawa, Makoto; Iwanaga, Masayuki; and Shouta, Koujirou, to Tokyo Shibaura Electric Co., Ltd. Scintillation camera. 4,223,388, Cl. 364-521.000.
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, to Murata Manufacturing Co., Ltd. Electrical filter employing transverse electromagnetic mode coaxial resonators. 4,223,287, Cl. 333-206.000.
Nishimura, Motohiro: *See*—
Amemiya, Kunio; Nishimura, Motohiro; and Kimura, Yoichi, 4,223,065, Cl. 428-272.000.

Nishimura, Toshio: *See*—
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Nishiyama, Yukinori: *See*—
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Nissan Chemical Industries, Limited: *See*—
Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; and Kawahara, Masao, 4,223,118, Cl. 526-128.000.

Nissan Motor Company, Limited: *See*—
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Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, 4,222,351, Cl. 123-3.000.
Maeda, Kouzo, 4,222,608, Cl. 297-410.000.
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Nitto Seiko Kabushiki Kaisha: *See*—
Kaneko, Atsunobu, 4,222,495, Cl. 221-68.000.

Niwa, Masatake; Inoue, Norihiro; Kawamura, Kunio; and Beppu, Norio, to Minolta Camera Kabushiki Kaisha. Photographic film wind-up and shutter charge mechanism. 4,222,649, Cl. 354-173.000.

Nizamoff, Alan J., to Exxon Research & Engineering Co. Use of once-through treat gas to remove the heat of reaction in solvent hydrogenation processes. 4,222,844, Cl. 208-8.0LE.

NL Industries, Inc.: *See*—
Saliger, Kenneth C.; and Jansen, Martin B., 4,222,592, Cl. 285-18.000.

Noble, Milton L.; Craig, Samuel E.; and Hoefer, William G., to General Electric Company. Phase corrected raster scanned light modulator and a variable frequency oscillator for effecting phase correction. 4,223,354, Cl. 358-233.000.

Noble, Wendell P., Jr.; and Unis, Richard A., to International Business Machines Corporation. Method for reducing parasitic capacitance in integrated circuit structures. 4,222,816, Cl. 156-643.000.

Noda, Hideo, to Shimano Industrial Company, Limited. Fishing reel. 4,222,537, Cl. 242-212.000.

Nohira, Hidetaka: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,222,237, Cl. 60-276.000.

Noji, Keiko: *See*—
Kubota, Yukio; Noji, Keiko; and Watanabe, Yoshimi, 4,223,358, Cl. 360-75.000.

Nolf, Roland S. Remote lighting device. 4,222,734, Cl. 431-156.000.

Nolt, Edwin B.; and Vansteelant, Marc G., to Sperry Corporation. Knotter mechanism. 4,222,220, Cl. 56-343.000.

Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, to Borg-Warner Corporation. Zero-valent mixed metal catalysts and process of preparation. 4,222,898, Cl. 252-447.000.

Nomoto, Yoshitaka: *See*—
Shimizu, Kazuma; Nomoto, Yoshitaka; and Kariyama, Shisou, 4,222,720, Cl. 418-121.000.

Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, to Nissan Motor Company, Limited. Speed alarm system for a motor vehicle. 4,223,297, Cl. 340-62.000.

Norco Industries, Inc.: *See*—
John, Julius F., 4,222,548, Cl. 254-8.00B.

Nordfor AB: *See*—
Lindgren, Mats, 4,222,549, Cl. 254-93.0HP.

Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Braeger, Horst, 4,222,152, Cl. 17-62.000.

Noro, Yoshihiko: *See*—
Hazama, Katashi; Yamada, Jun; and Noro, Yoshihiko, 4,223,285, Cl. 333-194.000.

Norris, John T. Compact portable darkroom. 4,222,655, Cl. 354-308.000.

Northeastern, Incorporated: *See*—
Jackson, Robert T., 4,222,297, Cl. 83-481.000.

Northern Telecom Limited: *See*—
Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., 4,223,308, Cl. 340-719.000.

Northrup, Stephen D.: *See*—
Lusk, George E.; and Northrup, Stephen D., 4,223,179, Cl. 174-73.00R.

Norton Company: *See*—
Alliegro, Richard A.; and Stark, Ronald A., 4,222,782, Cl. 106-57.000.

Novak, Richard E.: *See*—
Gubitose, Nicholas F.; Schuler, Malcolm R.; Ronan, Harold R., Jr.; and Novak, Richard E., 4,222,502, Cl. 222-240.000.

Novotny, Miroslav; and Anderson, Lowell R., to Allied Chemical Corporation. Production of hydrogen from carbon monoxide and water. 4,223,001, Cl. 423-655.000.

NRM Corporation: *See*—
Enders, George E., 4,222,811, Cl. 156-406.000.

Nunn, Bruce E.: *See*—
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,222,817, Cl. 162-4.000.

NUSTEP Trenndusen Entwickfungs- und Patentverwertungsgesellschaft mbH & Co. KG: *See*—
Wenzel, Werner, 4,222,752, Cl. 55-269.000.

Nuzzi, Francis J.; and Vitellaro, Daniel F., to Kollmorgen Technologies Corporation. Liquid seeders for electroless metal deposition. 4,222,778, Cl. 106-1.110.

Nyberg, David D.: *See*—
Boyer, Nicodemus E.; Cammack, Travers K., II; and Nyberg, David D., 4,223,071, Cl. 428-411.000.

Nyfeler, Alex; and Greenaway, David L., to LGZ Landis & Gyr Zug AG. Process for embossing a relief pattern into a thermoplastic information carrier. 4,223,050, Cl. 427-163.000.

Obayashi, Hideki: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,222,237, Cl. 60-276.000.

Ocampo, Don O.: *See*—
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Oce-van der Grinten N.V.: *See*—
Peeters, Wilhelmus M. M.; van Rhijn, Wilhelmus J.; and Timmermans, Robert M. G., 4,223,084, Cl. 430-87.000.

Oda, Isao; and Maekawa, Koichiro, to NGK Insulators, Ltd. Method for producing polycrystalline translucent alumina having an excellent in-line transmission. 4,222,978, Cl. 264-65.000.

Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries Limited. High chromium steel of mixed structure containing ferrite for high temperature use. 4,222,771, Cl. 75-124.000.

Odinokov, Boris P.: *See*—
Kostovetsky, Semen P.; Odinokov, Boris P.; Semenikhin, Anatoly Y.; Sankov, Anatoly E.; and Soin, Vladimir V., 4,222,612, Cl. 299-11.000.

O'Donnell, Frank M.: *See*—
Patton, Noel T.; Patton, Bennie N.; and O'Donnell, Frank M., 4,222,318, Cl. 98-94.00R.

Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, to Bayer Aktiengesellschaft. Methylol derivatives of 2,2,6,6-tetraalkylpiperidines and their production. 4,223,147, Cl. 546-224.000.

Oetiker, Hans. Hose clamp. 4,222,155, Cl. 24-20.00R.

Ogawa, Hisashi: *See*—
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,222,588, Cl. 280-804.000.

Ogawa, Takuzo: *See*—
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Ogura, Koichi; and Koinuma, Tokuju, to Tokyo Shibaura Electric Co., Ltd. Magnetron device exhibiting reduced microwave leakage. 4,223,245, Cl. 315-39.510.

Oh, Se H.: *See*—
Hegedus, Louis; Oh, Se H.; and Baron, Kenneth, 4,222,236, Cl. 60-274.000.

O'Hanlon, Peter J.; Woodford, Maurice C.; and Rogers, Norman H., to Beecham Group Limited. Isolation of organic acids. 4,222,942, Cl. 260-345.80R.

Ohba, Shinya: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.

Ohio Nuclear Inc.: *See*—
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Ohji, Kenzo: *See*—
Ono, Shusuke; Ohji, Kenzo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,223,286, Cl. 333-195.000.

Ohkoshi, Akio: *See*—
Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, 4,223,344, Cl. 358-67.000.

Ohnishi, Makoto: *See*—
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Ohnishi, Takashi: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.

Oil Base Germany G.m.b.H.: *See*—
Barthel, Horst K. F., 4,222,988, Cl. 422-309.000.

Oinoue, Kenichi; and Nagai, Shohei, to Olympus Optical Co., Ltd. Automatic focussing device. 4,223,348, Cl. 358-128.500.

Oka, Takashi: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Okada, Takashi: *See*—
Tsuchiya, Takao; Okada, Takashi; Ishigaki, Yoshio; and Omori, Shouji, 4,223,342, Cl. 358-37.000.

Okamoto, Kiyohide: *See*—
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Okamura, Masahiro: *See*—
Terasawa, Yoshio; Miyata, Kenji; Naito, Masayoshi; Ogawa, Takuzo; and Okamura, Masahiro, 4,223,328, Cl. 357-22.000.

Okimoto, Tomoyuki; Shiozaki, Tomoharu; and Miyake, Makoto, to Kanzaki Paper Mfg. Co., Ltd. Method of making oil-containing microcapsules. 4,222,891, Cl. 252-316.000.

Okinaka, Yutaka; and Smith, Lawrence E., to Bell Telephone Laboratories, Incorporated. Preparation of gold cyanide. 4,222,996, Cl. 423-371.000.

Okuda, Masaaki; and Tomisaki, Kiyotaka, to Diamon Engineering Co., Ltd. Process of regenerating and recovering lead sulphate-containing wastes. 4,222,769, Cl. 75-120.000.

O'Leary, Kevin P.: *See*—
Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., 4,222,902, Cl. 252-500.000.

O'Leary, Patrick J.: *See*—
Garrison, Robert L.; Gould, Rowan W.; O'Leary, Patrick J.; and Fryer, John L., 4,223,014, Cl. 424-92.000.

Olewinski, William J.; Smith, Teddy G.; and Papizan, John L., to F. C. Schaffer & Associates, Inc. Boarding platform. 4,222,140, Cl. 14-71.300.

Olin Corporation: *See*—
Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., 4,222,808, Cl. 156-245.000.
Hirdler, Louis C.; and Smialek, Raymond J., 4,223,140, Cl. 544-192.000.
Specht, Steven J.; and Woodard, Kenneth E., Jr., 4,222,831, Cl. 204-98.000.

Oliver, David P., to Oliver Design Specialties Ltd. Log splitter. 4,222,419, Cl. 144-193.00R.

Oliver, David W.; and Lavoo, Norman T., to United States of America, Army. Tube with bonded cathode and electrode structure and getter. 4,223,243, Cl. 313-268.000.

Oliver Design Specialties Ltd.: *See*—
Oliver, David P., 4,222,419, Cl. 144-193.00R.

Olshansky, Robert, to Corning Glass Works. Multicomponent optical waveguide having index gradient. 4,222,631, Cl. 350-96.310.

Olson, Delwyn L. Mercury float switch. 4,223,190, Cl. 200-84.00R.

Olson, Gary L., to Hoffmann-La Roche Inc. Process for the preparation of esters of 5-formyl-3-methyl-2,4-pentadien-1-ol. 4,222,943, Cl. 260-345.80R.

Olympia Werke AG: *See*—
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Olympus Optical Co., Ltd.: *See*—
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Kobayashi, Minoru, 4,222,536, Cl. 242-191.000.
Koshiishi, Kiyozo, 4,222,670, Cl. 356-414.000.
Oinoue, Kenichi; and Nagai, Shohei, 4,223,348, Cl. 358-128.500.
Suzuki, Hideo; Fujiwara, Toshihide; and Kaneko, Nobutaka, 4,222,843, Cl. 204-299.00R.
Terada, Katumi, 4,223,076, Cl. 429-96.000.
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Omori, Shouji: *See*—
Tsuchiya, Takao; Okada, Takashi; Ishigaki, Yoshio; and Omori, Shouji, 4,223,342, Cl. 358-37.000.

Omron Tateisi Electronics Co.: *See*—
Agatahama, Shunichi; Masaki, Akio; and Bando, Yoshihide, 4,223,290, Cl. 335-229.000.
Sakaguchi, Shunichi; and Okamoto, Kiyohide, 4,223,395, Cl. 365-229.000.

Omura, Ikuo: *See*—
Shibatani, Kyoichiro; Omura, Ikuo; and Yamauchi, Junichi, 4,222,780, Cl. 106-35.000.

Omura, Yoshiaki: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.

Ongaro, Theodore. Hydraulic power system. 4,222,309, Cl. 91-471.000.

Ono, Shusuke; Ohji, Kenzo; Yamazaki, Osamu; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave resonator. 4,223,286, Cl. 333-195.000.

Opalka, Chester J., Jr.; and Lesher, George Y., to Sterling Drug Inc. Process for producing 3-cyano-5-(pyridinyl)-2(1H)-pyridinones. 4,223,149, Cl. 546-257.000.

Optical Coating Laboratory, Inc.: *See*—
Bergfelt, Nils H.; and Seddon, Richard I., 4,222,345, Cl. 118-720.000.

Ortho Pharmaceutical Corp.: *See*—
Chen, Robert H. K., 4,222,937, Cl. 260-333.000.

Orwoll, Edward F.: *See*—
Price, John A.; and Orwoll, Edward F., 4,223,159, Cl. 560-205.000.

Osepchuk, John M., to Raytheon Company. Microwave tubes incorporating rare earth magnets. 4,223,246, Cl. 315-39.710.

Osterhout, Joseph C.: *See*—
Sweetana, Andrew S., Jr.; Gupta, Tapan K.; Kothmann, Richard E.; and Osterhout, Joseph C., 4,223,366, Cl. 361-127.000.

Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Alloy for occlusion of hydrogen. 4,222,770, Cl. 75-122.000.

Ota, Isamu; and Abe, Toshihito, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Exhaust gas recirculation system for an internal combustion engine. 4,222,357, Cl. 123-568.000.

Ota, Isamu: *See*—
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Yoshizaki, Shiro; Tamada, Shigeharu; Yo, Eiyu; and Nakagawa, Kazuyuki, 4,223,137, Cl. 544-128.000.

Ottestad, Jack B. Brake to decelerate axially moving actuating rod. 4,222,462, Cl. 188-67.000.

Outboard Marine Corporation: *See*—
Choudhury, Hrishikesh; and Luksch, Heinrich E., 4,222,474, Cl. 192-0.096.

Outokumpu Oy: *See*—
Tuovinen, Frans H.; Honkaniemi, Matti E.; Virta, Matias A.; and Krogerus, Helge J., 4,222,786, Cl. 106-117.000.

Overell, Brian G.: *See*—
Roy, Peter; Overell, Brian G.; and Stanworth, Denis R., 4,223,016, Cl. 424-177.000.

Owen, Edwin L.: *See*—
Hubred, Gale L.; and Owen, Edwin L., 4,222,832, Cl. 204-106.000.

Owens-Corning Fiberglas Corporation: *See*—
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,222,757, Cl. 65-2.000.
Parbhoo, Kantilal R., 4,222,344, Cl. 118-608.000.
Stotler, David V.; and Sanders, James E., 4,222,758, Cl. 65-11.00W.
Sunkle, Thomas H.; and Cox, John M., 4,222,448, Cl. 177-1.000.

Owens-Illinois, Inc.: *See*—
Burzynski, Alfred J., 4,223,121, Cl. 528-12.000.
Perry, Jack I., 4,222,480, Cl. 198-490.000.

Oxford Pendaflex Corporation: *See*—
Solomon, Jack, 4,222,190, Cl. 40-530.000.

Oxydental Products, Inc.: *See*—
Green, William; Heisler, Sidney; and Riazanow, Jay, 4,222,416, Cl. 141-27.000.

Ozaki, Tadashi: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,222,237, Cl. 60-276.000.

Pachuta, Martin: *See*—
Dehne, Clarence A.; and Pachuta, Martin, 4,222,481, Cl. 198-684.000.

Pacific Western Systems: *See*—
Engle, George M., Jr., 4,223,048, Cl. 427-39.000.

Palau, Joseph, to Etablissements Staubli. Mechanical device interposed between a dobby and a weaving loom. 4,222,415, Cl. 139-83.000.

Paoletti, Rodolfo: *See*—
Ferruti, Paolo; and Paoletti, Rodolfo, 4,223,011, Cl. 424-81.000.

Papizan, John L.: *See*—
Olewinski, William J.; Smith, Teddy G.; and Papizan, John L., 4,222,140, Cl. 14-71.300.

Pappert, Werner; Tenhaven, Ulrich; and Wolff, Friedrich, to Hoesch Werke Aktiengesellschaft. Method of depositing a protective surface layer on a very thin metal sheet. 4,223,047, Cl. 427-32.000.

Pappo, Raphael: *See*—
Bruhn, Mildred S.; and Pappo, Raphael, 4,223,158, Cl. 560-121.000.

Paranjpe, Suresh C.; and Donahue, John W., to Mead Corporation, The. Jet printer and electrode assembly therefor. 4,223,320, Cl. 346-75.000.

Parbhoo, Kantilal R., to Owens-Corning Fiberglas Corporation. Size applicator. 4,222,344, Cl. 118-608.000.

Park, Moon C. Method for the beneficiation of ore. 4,222,860, Cl. 209-159.000.

Parker, Cliff: *See*—
Start, Rick E.; Woldring, Bert; and Parker, Cliff, 4,222,496, Cl. 222-16.000.

Parker-Hannifin Corporation: *See*—
Herzan, Eugene H.; and Johnson, Lyle R., 4,222,411, Cl. 137-614.040.

Parker Pen Co., The: *See*—
Schmidt, Guenther, 4,222,595, Cl. 292-91.000.

Parker, Roy B., to Albany International Corp. Method of covering tennis balls. 4,222,806, Cl. 156-213.000.

Parker, William H., to Del Norte Technology, Inc. Methods of small volume pumping especially suited for oil recovery from stripper wells. 4,222,440, Cl. 166-314.000.

Parkinson, Ward D.; and Seelbach, Walter C., to Motorola, Inc. Integrated circuit substrate charge pump. 4,223,238, Cl. 307-297.000.

Parr, Erfried: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,222,995, Cl. 423-329.000.

Parsons, James S.: *See*—
Tarrant, Fred A.; and Parsons, James S., 4,222,188, Cl. 40-152.100.

Parsons, Patrick J., to Exxon Research & Engineering Co. Plate and frame filter press having modified flow pattern method. 4,222,873, Cl. 210-777.000.

Parssinen, Edwin J.; and Meyers, Theodore J., to United States of America, Navy. Broadband free-flooding magnetostrictive scroll transducer. 4,223,401, Cl. 367-168.000.

Pasch, Lambert M.; and Wagemann, Heinz, to Uniroyal Aktiengesellschaft. Transfer molding insulation unit. 4,222,732, Cl. 425-544.000.

Paszyc, Aleksy J.; Huang, Kwang T.; and Shiroma, Dallas M., to United States of America, Navy. Electrostatic charge generator. 4,223,241, Cl. 310-308.000.

Patel, Mahesh G.: *See*—
Weinstein, Marvin J.; Wagman, Gerald H.; Marquez, Joseph A.; and Patel, Mahesh G., 4,223,130, Cl. 536-17.00R.

Pathak, Saroj; and Perlegos, George, to Intel Corporation. Sensing amplifier for floating gate memory devices. 4,223,394, Cl. 365-210.000.

Patnaik, Birendra K.: *See*—
Allan, John L. H.; and Patnaik, Birendra K., 4,222,895, Cl. 252-429.00B.

Paton, Neil E.: *See*—
Hamilton, C. Howard; Mahoney, Murray W.; and Paton, Neil E., 4,222,797, Cl. 148-12.70A.

Patton, Bennie N.: *See*—
Patton, Noel T.; Patton, Bennie N.; and O'Donnell, Frank M., 4,222,318, Cl. 98-94.00R.

Patton Electric Co., Inc.: *See*—
Patton, Noel T.; Patton, Bennie N.; and O'Donnell, Frank M., 4,222,318, Cl. 98-94.00R.

Patton, Noel T.; Patton, Bennie N.; and O'Donnell, Frank M., to Patton Electric Co., Inc. Combination window and floor fan. 4,222,318, Cl. 98-94.00R.

Patton, Roy D.; and Rietveld, Frank P. Artificial Christmas tree stand. 4,222,545, Cl. 248-524.000.

Paul, Gerald: *See*—
Born, Eberhard; and Paul, Gerald, 4,223,219, Cl. 250-272.000.

Paulke, Bodo; and Walz, Alfred, to Siemens Aktiengesellschaft. Amplifier for electrical signals. 4,223,274, Cl. 330-133.000.

Pauls, Stanley L.: *See*—
Halek, George W.; Freed, William T.; Schaul, Jerome S.; Rupp, Raymond W.; and Pauls, Stanley L., 4,223,128, Cl. 528-481.000.

Pavlovsky, Rudolf, to George Fischer Aktiengesellschaft. Machine tool feed system with adjustable bearings. 4,222,692, Cl. 409-141.000.

Payne, Delmar V., to Bendix Corporation, The. Turbulence detector for non-coherent pulse radar. 4,223,309, Cl. 343-5.00W.

Payne, Jimmy R.: *See*—
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,223,301, Cl. 340-500.000.

Pearson, Robert J., to National Gypsum Company. Straddling stackable stud. 4,222,211, Cl. 52-741.000.

Peck, Clarence E.: *See*—
Miller, William R.; and Peck, Clarence E., 4,223,385, Cl. 364-472.000.

Peeters, Wilhelmus M. M.; van Rhijn, Wilhelmus J.; and Timmermans, Robert M. G., to Oce-van der Grinten N.V. Photoconductive element based on mixed zinc oxides. 4,223,084, Cl. 430-87.000.

Peitsmeier, Karl, to Daimler-Benz Aktiengesellschaft. Steering lock for motor vehicles. 4,222,253, Cl. 70-417.000.

Pellegrini, John P., Jr., to Gulf Research & Development Company. Process for preparing a substituted diphenoxybenzene. 4,222,962, Cl. 260-571.000.

Pelrine, Bruce P.; and Chen, Nai Y., to Mobil Oil Corporation. Production of high viscosity index lubricating oil stock. 4,222,855, Cl. 208-111.000.

Peltzer, Bernd: *See*—
von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

Pennbrook Corporation: *See*—
Bals, Edward J., 4,222,523, Cl. 239-216.000.

Pennzoil Company: *See*—
Drechsel, Erhart K., 4,222,990, Cl. 423-158.000.

Perkin-Elmer Corporation, The: *See*—
Chamran, Morteza M.; and Dimovski, Milan R., 4,223,215, Cl. 250-211.00R.

Perlegos, George: *See*—
Pathak, Saroj; and Perlegos, George, 4,223,394, Cl. 365-210.000.

Perrin, Jean: *See*—
Leblanc, Michel; Laneres, Jacques; and Perrin, Jean, 4,222,261, Cl. 73-29.000.

Perry, Jack I., to Owens-Illinois, Inc. 90° Sweepout drive mechanism. 4,222,480, Cl. 198-490.000.

Persico, Thomas M.; Dudas, Richard M.; and Shusta, George W. Oral radiation protector appliance. 4,223,229, Cl. 250-515.000.

Peruyero, Jose M. A.: *See*—
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., 4,222,986, Cl. 422-131.000.

Peters, Charles O., Jr. Telephone controlled order entry system. 4,223,183, Cl. 179-2.0DP.

Peters, George T.; and Lonning, Kjell, to United Technologies Corporation. Laser welding apparatus for shipyard panel shops. 4,223,201, Cl. 219-121.0LC.

Peters, George T.; and Banas, Conrad M., to United Technologies Corporation. Apparatus and method for welding boat subassemblies utilizing laser radiation. 4,223,202, Cl. 219-121.00L.

Peterson Metal Products, Ltd.: *See*—
Peterson, Wallace H., 4,222,209, Cl. 52-172.000.

Peterson, Wallace H., to Peterson Metal Products, Ltd. Cornerpiece for use in multiple pane window. 4,222,209, Cl. 52-172.000.

Peterson, William H., to Pullman Incorporated. Hopper discharge door operating mechanism. 4,222,334, Cl. 105-250.000.

Pfizer Inc.: *See*—
Kurowsky, Stephen R., 4,223,120, Cl. 526-208.000.

Phillips, Gary M.; and Untereker, Darrel F., to Medtronic, Inc. Cathode materials. 4,223,110, Cl. 525-356.000.

Phillips, Peter J.: *See*—
Uyeda, Tim M., 4,222,251, Cl. 70-1.500.

Phillips Petroleum Company: *See*—
Adachi, Ryoichi; and Hayashi, Toshihito, 4,222,727, Cl. 425-222.000.
Moczygemba, George A.; and Hsieh, Henry L., 4,223,116, Cl. 526-117.000.
Smith, Ernest L., 4,222,974, Cl. 156-272.000.

Pickard, Jurgen: *See*—
Helmer, Josef; and Pickard, Jurgen, 4,222,290, Cl. 74-801.000.

Picker Corporation: *See*—
Gambini, Michael R.; and Benenson, Gary, 4,223,221, Cl. 250-363.00S.

Picou, Claude H., to Le Materiel Telephonique. Multifrequency digital signal receiver. 4,223,185, Cl. 179-84.0VF.

Pierce, Richard L.: *See*—
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,223,301, Cl. 340-500.000.

Pierce, William S.: *See*—
Donachy, James H.; and Pierce, William S., 4,222,127, Cl. 3-1.700.

Pigeon, Dale W., to General Motors Corporation. Automotive tape drive window regulator. 4,222,202, Cl. 49-352.000.

Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, to Labaz. Urea derivatives to treat anxiety and aggressivity. 4,223,041, Cl. 424-322.000.

Pinkert, Jurgen: *See*—
Wahli, Robert; and Pinkert, Jurgen, 4,222,661, Cl. 355-38.000.

Plaza, Mario G.; and Waibel, Helmut K., to Durango Systems, Inc. Print head carriage assembly for serial printers. 4,222,673, Cl. 400-56.000.

Pletka, Hans-Dieter; and Zezulka, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Sulfur and phosphorus containing organosilicon compounds and process for their production and use. 4,222,930, Cl. 260-42.150.

Pocheville, Robert: *See*—
Brulet, Daniel; Pocheville, Robert; and Chauvel, Bernard, 4,222,882, Cl. 252-51.50A.

Pointon, Peter C., to Wilkinson Sword Limited. Garden cloche blank. 4,222,196, Cl. 47-27.000.

Pollet, Jean-Claude: *See*—
Beatty, Charles L.; and Pollet, Jean-Claude, 4,222,982, Cl. 264-143.000.

Polymer Corporation, The: *See*—
Gage, Paul E.; and Church, Richard O., 4,222,331, Cl. 105-199.00C.

Polysar Limited: *See*—
Briggs, George J.; and Wei, Yung-Kang, 4,222,906, Cl. 260-5.000.

Polysius AG: *See*—
Deppe, Antonius, 4,222,735, Cl. 432-80.000.

Pomeroy, Gary W.: *See*—
Latimer, Robert C.; and Pomeroy, Gary W., 4,222,207, Cl. 52-169.300.

Pompei, Francesco; and Gerstmann, Joseph, to Boston Gas Products, Inc. Efficient heating and domestic hot water apparatus. 4,222,350, Cl. 122-32.000.

Pongracz, Endre, to Societe Anonyme des Plieuses Automatiques (SAPAL). Packaging material feeding device for a packaging machine. 4,222,533, Cl. 242-58.300.

Popescu, Francine. Alkaline zinc electroplating bath and process. 4,222,829, Cl. 204-55.00R.

PPG Industries, Inc.: *See*—
Carlson, Gordon A., 4,222,833, Cl. 204-128.000.
Christenson, Roger M.; and Erikson, J. Alden, 4,222,911, Cl. 260-22.0TN.

Praprotnik, Louis. Exercise machine. 4,222,376, Cl. 128-25.00R.

Pratt, James W. Basement emergency exit. 4,222,458, Cl. 182-81.000.

Pratt & Whitney Aircraft of Canada Limited: *See*—
Schaum, Hans H.; Tedstone, Donald J.; Ma, Ching-Yee; and Sanderson, John J., 4,222,703, Cl. 415-53.00R.

Pravda, Milton F., to Dynatherm Corporation. Heat exchange apparatus. 4,222,436, Cl. 165-105.000.

Precision Dynamics Corporation: *See*—
Newman, Howard F.; and King, David L., 4,223,093, Cl. 435-295.000.

Preiss, Michael; and Metzger, Karl G., to Bayer Aktiengesellschaft. β-Lactam antibiotics and their use. 4,223,037, Cl. 424-271.000.

Prendergast, John F., Sr.: *See*—
Gray, David A.; Sivertsen, Marvin L.; Adam, Jerome H.; and Prendergast, John F., Sr., 4,223,222, Cl. 250-363.00S.

Preston, Jack: *See*—
Horton, Anthony; McKeon, Thomas M.; and Preston, Jack, 4,223,206, Cl. 219-374.000.

Price, John A.; and Orwoll, Edward F., to FMC Corporation. By-product recycling process. 4,223,159, Cl. 560-205.000.

Price, Raymond: *See*—
Greenall, Antony; Price, Raymond; and Quan, Peter M., 4,222,935, Cl. 260-205.000.

Procter & Gamble Company, The: *See*—
Cockrell, John R., Jr., 4,222,905, Cl. 252-547.000.
Guilloty, Haydee R., 4,223,163, Cl. 568-618.000.

Prosl, Frank R.: *See*—
Sampson, Edward J.; and Prosl, Frank R., 4,222,374, Cl. 128-1.00R.

Pullman Incorporated: *See*—
Peterson, William H., 4,222,334, Cl. 105-250.000.
Rousseau, George L.; and Snyder, Richard C., 4,222,336, Cl. 105-418.000.
Schuller, James J., 4,222,333, Cl. 105-250.000.

Quan, Peter M.: *See*—
Greenall, Antony; Price, Raymond; and Quan, Peter M., 4,222,935, Cl. 260-205.000.

Quenin, Paul P.: *See*—
Good, Robert D., deceased; and Quenin, Paul P., 4,222,851, Cl. 208-45.000.

Quere, Eugene M.; and Le Rolland, Pierre M., to ITT Industries, Inc. Pluggable miniature relay. 4,223,370, Cl. 361-331.000.

Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Means for sensing and color multiplexing optical data over a compact fiber optic transmission system. 4,223,216, Cl. 250-226.000.

Quick, William H.; August, Rudolf R.; James, Kenneth A.; Strahan, Virgil H., Jr.; and Nichols, Donald K., to Rockwell International Corporation. Fiber optic temperature sensor. 4,223,226, Cl. 250-458.000.

Raasch, Hans, to W. Schlafhorst & Co. Device for temporarily stopping the operation of spinning stations. 4,222,224, Cl. 57-263.000.

Rackman, Michael I.: *See*—
Castelluzzo, James M.; and Rackman, Michael I., 4,223,055, Cl. 428-40.000.

Rademacher, Leo E., to Monsanto Company. Polyarylene arylate compositions. 4,222,932, Cl. 260-45.9KB.

Radio Steel & Mfg. Co.: *See*—
Tonelli, Roger; and Michelau, Fredrick, 4,222,582, Cl. 280-87.02R.

Ragazzini, Franco; and Colombo, Roberto, to Lavorazione Materie Plastiche L.M.P. S.p.A. Screw extruder for thermoplastic synthetic foams. 4,222,729, Cl. 425-378.00R.

Rahrig, Donald D.: *See*—
Revells, Robert G.; and Rahrig, Donald D., 4,222,764, Cl. 65-348.000.

Raine, Paul R.; and Westcott, Lawrence, to Wiggins Teape Limited. Pressure-sensitive copying paper. 4,223,060, Cl. 428-199.000.

Ramirez, Ernest R., to Dravo Corporation. Reclamation of molybdenum or other heavy metals from wastewater treatment skimmings. 4,222,872, Cl. 423-57.000.

Rauch, Moriz v., to Siemens Aktiengesellschaft. Charged-particle beam optical apparatus including a damped supplemental oscillator for the specimen holder thereof. 4,223,224, Cl. 250-442.000.

Ravier, Dominique: *See*—
Bouy, Pierre; and Ravier, Dominique, 4,222,842, Cl. 204-290.00F.

Ravussin, Pierre E. Apparatus for automatically measuring the vertical profile of the temperature in the atmosphere. 4,222,265, Cl. 73-170.00R.

Rawson, Paul O.; Nagy, Louis E.; and Veth, George J., to United States Surgical Corporation. Unitary disposable sanitary sheath for temperature and respiration sensing probe. 4,222,391, Cl. 128-736.000.

Raychem Corporation: *See*—
Boyer, Nicodemus E.; Cammack, Travers K., II; and Nyberg, David D., 4,223,071, Cl. 428-411.000.
Diaz, Stephen H., 4,223,209, Cl. 219-549.000.

Raytheon Company: *See*—
Cappon, Arthur M.; and Sage, Jay P., 4,223,233, Cl. 307-221.00D.
Doran, Robert W., 4,223,252, Cl. 315-375.000.
Lowenschuss, Oscar, 4,223,404, Cl. 375-94.000.
Osepchuk, John M., 4,223,246, Cl. 315-39.710.

Razzano, John S.; De Zuba, George P.; and Reo, Ned J., to General Electric Company. Process aids for heat cured silicone rubber compositions. 4,222,917, Cl. 260-29.1SB.

RCA Corporation: *See*—
Ahmed, Adel A. A., 4,223,280, Cl. 331-111.000.
Ahmed, Adel A. A., 4,223,281, Cl. 331-111.000.
Bendell, Sidney L., 4,223,253, Cl. 315-382.000.
Bingham, Joseph P.; and Lagoni, William A., 4,223,340, Cl. 358-31.000.
Chan, Kwok K., 4,223,283, Cl. 333-109.000.
Gubitose, Nicholas F.; Schuler, Malcolm R.; Ronan, Harold R., Jr.; and Novak, Richard E., 4,222,502, Cl. 222-240.000.
Haferl, Peter E., 4,223,251, Cl. 315-370.000.
Lagoni, William A.; and Fuhrer, Jack S., 4,223,339, Cl. 358-31.000.
Levine, Peter A., 4,223,234, Cl. 307-221.00D.

Reading Door Closer Corp.: *See*—
Burnett, L. Nelson, Jr., 4,222,147, Cl. 16-62.000.

Readio, Philip D.: *See*—
Bengali, Ajay M.; Zuendt, Richard F.; Allan, John L. H.; and Readio, Philip D., 4,222,779, Cl. 106-14.120.

Redlich, Horst; Hartmann, Werther; and Dickopp, Gerhard, to Ted Bildplatten AEG Telefunken. Method and circuit for driving a piezoelectric transducer. 4,223,242, Cl. 310-316.000.

Reed, Anthony, to Amerace Corporation. High voltage electrical connector shield construction. 4,222,625, Cl. 339-143.00C.

Reed, Ronald H.: *See*—
Cox, Russell; Drilling, Joseph C.; and Reed, Ronald H., 4,222,627, Cl. 339-147.00R.

Rees, Richard W., to Du Pont de Nemours, E. I., and Company. Warp size for filament yarn consisting essentially of polyvinyl alcohol having a degree of hydrolysis of 88–100%, quaternary ammonium surfactant and plasticizer. 4,222,922, Cl. 260-29.6BE.

Regan, John, to Regan Offshore International, Inc. Equally tensioned coupling apparatus. 4,222,590, Cl. 285-14.000.

Regan Offshore International, Inc.: *See*—
Regan, John, 4,222,590, Cl. 285-14.000.

Regie Nationale des Usines Renault: *See*—
Chabrol, Jean, 4,223,313, Cl. 340-870.070.

Regner, Hans: *See*—
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 201-2.500.

Reichenbach, Donald F.: *See*—
Shanoski, Henry; and Reichenbach, Donald F., 4,222,929, Cl. 260-40.0TN.

Reid, Robert A., to CPC Engineering Corporation. Roller support for a lift pump. 4,222,704, Cl. 415-72.000.

Reimer, Paul. Car top tent. 4,222,400, Cl. 135-1.00A.

Reimer, Richard A., to Atlas Foundry & Machine Co. Device for detection of short circuits in industrial uses. 4,223,306, Cl. 340-650.000.

Reineck, Ronald W.: *See*—
Carlstrom, William L.; Reineck, Ronald W.; and Svoboda, Glenn R., 4,223,068, Cl. 428-310.000.

Reinert, Gerard E., to Mobay Chemical Corporation. Flame retardant aromatic polycarbonate with good mechanical properties and melt stability. 4,223,100, Cl. 525-146.000.

Reisgies, Rolf W. Milk line back flushing method and apparatus. 4,222,346, Cl. 119-14.180.

Reiter, Peter: *See*—
Liedek, Egon; Dimroth, Peter; Ruff, Wolfgang; Berger, Gerhard; and Reiter, Peter, 4,222,788, Cl. 106-289.000.

Reitz, Norman E., to Sotek Corporation. Method for forming a crystalline film for a paramagnetic sodium thallium type intermetallic compound. 4,222,814, Cl. 156-612.000.

Rejto, Thomas. Simultaneous transfer printing and embossing or surface texturing method, and embossing member for use therein. 4,223,057, Cl. 428-138.000.

Reker, Jay J.: *See*—
Svedberg-Reker, Laura J.; and Reker, Jay J., 4,222,139, Cl. 5-498.000.

Relf, Graham T.: *See*—
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,222,262, Cl. 73-81.000.

Rempel, Dieter: *See*—
Bier, Peter; Binsack, Rudolf; and Rempel, Dieter, 4,223,106, Cl. 525-173.000.

Renelt, Gerhard; and Rothgordt, Ulf, to U.S. Philips Corporation. Method and arrangement for facsimile picture transmission. 4,223,356, Cl. 358-261.000.

Reo, Ned J.: *See*—
Razzano, John S.; De Zuba, George P.; and Reo, Ned J., 4,222,917, Cl. 260-29.1SB.

Research Triangle Institute: *See*—
Murray, Royce W.; Moses, P. R.; and Wier, Larry, 4,223,049, Cl. 427-126.000.

Revells, Robert G.; and Rahrig, Donald D., to Libbey-Owens-Ford Company. Glass sheet supporting and conveying apparatus. 4,222,764, Cl. 65-348.000.

Rexnord Inc.: *See*—
Lemke, Gregory D., 4,222,718, Cl. 418-26.000.

Rexroth GmbH: *See*—
Dantlgraber, Jorg, 4,222,714, Cl. 417-273.000.

Reynolds, Elizabeth H.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,222,896, Cl. 252-437.000.

Reynolds Metals Company: *See*—
Dewey, John L.; Scott, Charles E.; and Rushing, John C., 4,223,000, Cl. 423-631.000.
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,222,494, Cl. 220-66.000.

Reze, Rene: *See*—
Boutin, Francois-Regis; Deleuze, Michel; Marchive, Daniel; and Reze, Rene, 4,222,774, Cl. 75-148.000.

Rheinisch-Westfalisches Elektrizitats Werk AG: *See*—
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Rheinmetall GmbH: *See*—
Roettges, Werner; Becker, Wilfried; and Lipp, Herbert, 4,222,307, Cl. 89-37.00C.

Rhodes, John; and Douglas, William. Adhesive composition and method of use. 4,222,923, Cl. 260-31.8DR.

Rhone-Poulenc Industries: *See*—
Bouy, Pierre; and Ravier, Dominique, 4,222,842, Cl. 204-290.00F.
Brulet, Daniel; Pocheville, Robert; and Chauvel, Bernard, 4,222,882, Cl. 252-51.50A.
Jouffret, Michel, 4,223,165, Cl. 568-771.000.

Riazanow, Jay: *See*—
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Richardson, Robert H., to Evans, Samuel Cornelious. Magnetic marker. 4,222,517, Cl. 235-493.000.

Richmond, James W.: *See*—
Crim, Paul E.; Richmond, James W.; and Yeomans, Thomas E., 4,222,132, Cl. 5-81.00R.

Richmond, John R.: *See*—
Scherrer, Claude; Durrieu, Marc; and Richmond, John R., 4,222,853, Cl. 208-48.0AA.

Ricoh Company, Ltd.: *See*—
Abe, Shintaro; and Haganuma, Tomoyuki, 4,223,393, Cl. 364-900.000.
Furukawa, Masamichi, 4,223,271, Cl. 328-127.000.

Rider, Richard H.: *See*—
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Rieser, Elmer P.: *See*—
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Rieter Machine Works Ltd.: *See*—
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Rigging International: *See*—
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Riggs, Olen L., Jr.; and Brunsell, Dennis A., to Kerr-McGee Corporation. Process for oxidizing vanadium and/or uranium. 4,222,826, Cl. 204-1.500.

Righini, Giancarlo; Russo, Vera; and Sottini, Stefano, to Consiglio Nazionale Delle Ricerche. Optical thin film processor for unidimensional signals. 4,222,628, Cl. 350-96.110.

Rigterink, Raymond H., to Dow Chemical Company, The. 6-Fluoro-3,5-dichloro-2-pyridinyl phosphorus compounds. 4,223,025, Cl. 424-200.000.

Rittersdorf, Walter: *See*—
Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, 4,223,089, Cl. 435-12.000.
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Rizzo, Joseph F.: *See*—
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Rob. Hammerstein GmbH: *See*—
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Robert Bosch GmbH: *See*—
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Will, Gerhard; and Stroh, Walter, 4,222,292, Cl. 74-866.000.
Robert, Jacques, to Commissariat a l'Energie Atomique. Array of optical gates. 4,222,638, Cl. 350-96.140.
Roberts, George C., to Inca-One Corporation. Waterless flush toilet system. 4,222,130, Cl. 4-321.000.
Robertshaw Controls Company: *See*—
Bechtel, Jon H., 4,223,195, Cl. 219-10.55B.
Teichert, Allen L., 4,223,291, Cl. 337-303.000.
Robinson, A. Zed: *See*—
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Robinson, Ronald L., to United Technologies Corporation. Method and apparatus for reducing nitrous oxide emissions from combustors. 4,222,232, Cl. 60-737.000.
Rockwell-Golde G.m.b.H.: *See*—
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Rockwell International Corporation: *See*—
Bippus, Jacob R., 4,222,294, Cl. 81-177.00R.
Hamilton, C. Howard; Mahoney, Murray W.; and Paton, Neil E., 4,222,797, Cl. 148-12.70A.
Henry, Rodney D., 4,222,668, Cl. 356-350.000.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,223,216, Cl. 250-226.000.
Quick, William H.; August, Rudolf R.; James, Kenneth A.; Strahan, Virgil H., Jr.; and Nichols, Donald K., 4,223,226, Cl. 250-458.000.
Romberg, Edgar B., 4,222,617, Cl. 308-9.000.
Thomson, Wallace B., 4,222,365, Cl. 126-400.000.
Rod, Robert L., to Monogram Industries, Inc. Dual polarization antenna couplets. 4,223,317, Cl. 343-803.000.
Rodgers, John L., Jr., to Solid Controls, Inc. Electro-hydraulic ram control apparatus. 4,222,725, Cl. 425-145.000.
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler; and Henkel & Cie. Process for the production of aluminum silicates. 4,222,995, Cl. 423-329.000.
Roettges, Werner; Becker, Wilfried; and Lipp, Herbert, to Rheinmetall GmbH. Arrangement for tilt-equalization of steep angle firing weapons. 4,222,307, Cl. 89-37.00C.
Rogers, Norman H.: *See*—
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Roller Bearing Company of America: *See*—
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Rollmann, Louis D., to Mobil Oil Corporation. Sorbent for removing metals from fluids. 4,222,897, Cl. 252-439.000.
Rolls-Royce Limited: *See*—
Jubb, Albert, 4,222,367, Cl. 126-419.000.
Jubb, Albert; and Stansbury, Eric W., 4,222,369, Cl. 126-438.000.
Mobsby, John A., 4,222,243, Cl. 60-742.000.
Roman, Steven A., to Shell Oil Company. 3-(Hydrocarbylthiomethyl)-2,2-dimethyl-cyclopropanecarboxylate pesticides and their preparation. 4,223,155, Cl. 560-15.000.
Romanauskas, William A.: *See*—
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Romberg, Edgar B., to Rockwell International Corporation. Self loading cylindrical autolubricated gas bearing. 4,222,617, Cl. 308-9.000.
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Gubitose, Nicholas F.; Schuler, Malcolm R.; Ronan, Harold R., Jr.; and Novak, Richard E., 4,222,502, Cl. 222-240.000.
Rongley, Raymond A., to Roller Bearing Company of America. Slip clutch. 4,222,246, Cl. 64-30.00E.
Roos, Ernst: *See*—
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Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, to Metabio Joullie. Therapeutically useful N-phenylaniline derivatives. 4,223,039, Cl. 424-275.000.
Rosen, Irving: *See*—
Li, George S.; and Rosen, Irving, 4,223,107, Cl. 525-206.000.
Rosenblad, Axel E., to Rosenblad Corporation. Pressure vacuum breaker. 4,222,405, Cl. 137-216.100.
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Rosenblad, Axel E., 4,222,405, Cl. 137-216.100.
Rosenfeld, Robert B., to Eastman Kodak Company. Ultrasonography. 4,223,082, Cl. 430-3.000.
Rosenkrantz, Bernard E.; and Stupak, Elliot, to Schering Corporation. Stabilized aminoglycoside antibiotic formulations. 4,223,022, Cl. 424-180.000.
Rosenstock, Winfried. Method of driving sheet piles into a rock substratum. 4,222,684, Cl. 405-232.000.
Ross, William J.: *See*—
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,222,946, Cl. 260-347.300.
Rossi, Charles E.: *See*—
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Rost, Duane F.; and Ameduri, Gene J., to General Extrusions, Inc. Solar energy collection apparatus and system. 4,222,368, Cl. 126-438.000.
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., to A. E. Staley Manufacturing Company. Continuous process for making alkyl aldosides from starch or other carbohydrates. 4,223,129, Cl. 536-4.000.
Roth, Erich, to Dr. Wachter Kurmittel GmbH. Massage container having a double closure. 4,222,676, Cl. 401-28.000.
Roth, Leo; and Roth, Ursula. Device for removably storing drill bits. 4,222,486, Cl. 206-379.000.
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Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Process and diagnostic device for the determination of ammonia and of substrates which react with the formation of ammonia. 4,223,089, Cl. 435-12.000.
Rothgordt, Ulf: *See*—
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Rothmans of Pall Mall Canada Limited: *See*—
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Rowe International, Inc.: *See*—
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Rowley, Richard L. Posture case. 4,222,138, Cl. 5-448.000.
Roy, Peter; Overell, Brian G.; and Stanworth, Denis R., to Beecham Group Limited. Peptides. 4,223,016, Cl. 424-177.000.
Rozell, James O.; and Abmayr, David W., to Harris Corporation. Lookahead memory address control system. 4,223,381, Cl. 364-200.000.
Rozenboom, Jaap: *See*—
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Rubens, Harry E., to Institute of Applied Biology Special Cancer Research Project. Objective determination of the rate of oxygen utilization in peripheral tissue. 4,222,389, Cl. 128-633.000.
Rubino, Andrew M.; Jones, John L.; and Bretschneider, Edward S., to Armour Pharmaceutical Company. Basic zirconium complexes and methods of making and using in antiperspirants. 4,223,010, Cl. 424-66.000.
Rudolph, Hans: *See*—
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Ruhrchemie Aktiengesellschaft: *See*—
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Rundell, Dan J.: *See*—
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Ruschke, Ricky R.; and Schwades, Bette R., to Baxter Travenol Laboratories, Inc. One-way flex valve. 4,222,407, Cl. 137-512.150.
Rush, Earl E., to Cooper Industries, Inc. Deceleration sensitive air tool shutoff. 4,222,702, Cl. 415-25.000.
Rushing, John C.: *See*—
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Russo, Olerio. Golf game device including distortable playing surface. 4,222,568, Cl. 273-176.00H.
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Sabee, Reinhardt N. Pattern drawing of webs, and product produced thereby. 4,223,063, Cl. 428-224.000.

Sabol, Karol. Method for in situ gas production from coal seams. 4,222,437, Cl. 166-245.000.

Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for the preparation of bromoarylacetylene and aryldiacetylene precursors. 4,223,172, Cl. 568-812.000.

Sage, Jay P.: *See—*
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Sakaguchi, Shunichi; and Okamoto, Kiyohide, to Omron Tateisi Electronics Co. Volatile memory hold device. 4,223,395, Cl. 365-229.000.

Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, to Hitachi, Ltd. Process for producing electric windings. 4,222,802, Cl. 156-53.000.

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Sakashita, Tsutomu; and Yamazaki, Isao, to Sumitomo Metal Industries Limited. Molten steel outflow automatically controlling device. 4,222,506, Cl. 222-600.000.

Saliger, Kenneth C.; and Jansen, Martin B., to NL Industries, Inc. Toggle mechanism connector. 4,222,592, Cl. 285-18.000.

Salkazanov, Pierre: *See—*
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Sami, Hiroshi: *See—*
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Sampson, Edward J.; and Prosl, Frank R., to Metal Bellows Corporation. Septum locating apparatus. 4,222,374, Cl. 128-1.00R.

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Sanders Associates, Inc.: *See—*
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Sanders, James M.: *See—*
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Sandoz Ltd.: *See—*
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Sanfilippo, Margherita. Bow guide for a stringed instrument. 4,222,302, Cl. 84-283.000.

Sangster, Harold L. Pressure and temperature responsive protective devices. 4,223,364, Cl. 361-37.000.

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Sano, Takezo; Kobayashi, Akio; and Yamada, Yasuharu, to Sumitomo Chemical Company, Limited. Process for producing olefin polymers. 4,223,117, Cl. 526-121.000.

Sansom, David J.; and Case, Derek F., to Data Recording Instrument Company, Ltd. Magnetic recording transducers. 4,223,360, Cl. 360-123.000.

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Sarides, Anthanase K. Floor matting. 4,222,695, Cl. 410-68.000.

Sartorius, Wilfried; and Stock, Don J. R., to Endress & Hauser GmbH & Co. Circuit arrangement for measuring pulse widths. 4,223,267, Cl. 368-118.000.

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Savage, William T., to Wehr Corporation. Brick press including a removable plunger assembly and method for removing the plunger assembly. 4,222,726, Cl. 425-195.000.

Savin Corporation: *See—*
Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., 4,222,675, Cl. 400-474.000.

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Sawada, Mitsuo, to Yoshida Kogyo K.K. Molds for injection molding of continuous slide fastener chain. 4,222,723, Cl. 425-116.000.

Sawamura, Mitsuyoshi, to Amada Company, Limited. Lubricating apparatus for horizontal bandsaw machines. 4,222,295, Cl. 83-169.000.

Scannell, Edward F., to General Electric Company. Adjustable spring regulator for setting indicating instrument pointer. 4,223,266, Cl. 324-154.00R.

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Schack, Carl J.; and Christe, Karl O. Method for synthesizing fluorocarbon halides. 4,222,968, Cl. 260-653.000.

Schaefer, Louis C. Wedge-type gate valve. 4,222,406, Cl. 137-246.220.

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Schaloske, Peter; Kuffel, Wolfgang; and Brinkmann, Franz J., to Deutsche Babcock Aktiengesellschaft. Offshore construction. 4,222,683, Cl. 405-204.000.

Scharein, Gunter: *See—*
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Scheller, Hans-Ulrich, to Wurttembergische Parfumerie-Fabrik GmbH. Paste and powder dentifrices. 4,223,003, Cl. 424-7.000.

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Scheurecker, Werner, to Voest-Alpine Aktiengesellschaft. Arrangement for separating the starter bar from the hot strand in the strand guideway of a continuous casting plant. 4,222,432, Cl. 164-446.000.

Schierholt, Joseph: *See—*
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Schmid, Bruce K., to Gulf Oil Corporation. Integrated coal liquefaction-gasification-naphtha reforming process. 4,222,845, Cl. 208-8.0LE.

Schmid, Bruce K., to Gulf Oil Corporation. Coal liquefaction-gasification process including reforming of naphtha product. 4,222,846, Cl. 208-8.0LE.

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Carr, Norman L.; and Schmid, Bruce K., 4,222,848, Cl. 208-8.0LE.

Schmid, Hans-Peter; and Schlunt, Richard S., to General Dynamics Corporation Pomona Division. Multiplexed CCD pulse width discriminator. 4,223,270, Cl. 328-112.000.

Schmidlkofer, Richard: *See—*
August, Peter; Hechtl, Wolfgang; and Schmidlkofer, Richard, 4,222,983, Cl. 264-220.000.

Schmidt, Guenther, to Parker Pen Co., The. Clamping closure for releasably connecting two parts. 4,222,595, Cl. 292-91.000.

Schmidt, Karin, to Geba Geratebau GmbH, Firma. Method of and apparatus for shelling shellfish such as prawns or shrimps. 4,222,153, Cl. 17-73.000.

Schmidt, Robert A.: *See—*
Berger, Leo; and Schmidt, Robert A., 4,222,944, Cl. 260-346.710.

Schmitt, Frederick L.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,222,941, Cl. 260-345.100.

Schneider, Abraham: *See—*
Myers, Harry K., Jr.; and Schneider, Abraham, 4,222,800, Cl. 149-109.600.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,223,131, Cl. 542-428.000.

Schon, Manfred: *See—*
Honel, Hans; Keller, Karlfried; Michel, Walter; and Schon, Manfred, 4,223,141, Cl. 544-196.000.

Schonbeck, Rupert: *See—*
Wechsberg, Manfred; and Schonbeck, Rupert, 4,222,960, Cl. 260-559.00R.

Schossow, George W. Surgical drape and suture. 4,222,383, Cl. 128-335.000.

Schramer, Kurt M.; and Ocampo, Don O., to Stauffer Chemical Company. Dimensionally stable, calendered vinyl film. 4,223,054, Cl. 428-40.000.

Schreiber, William L.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.

Schreinemacher, Herbert: *See—*
Hennings, Detlev; and Schreinemacher, Herbert, 4,222,885, Cl. 252-63.200.

Schreyer, Kenneth D.; and Borowiec, Richard A., to Columbus McKinnon Corporation. Bi-directional wrench. 4,222,293, Cl. 81-90.00B.

Schrodter, Klaus: *See—*
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,222,994, Cl. 423-321.00S.

Schroer, Hans: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, 4,223,147, Cl. 546-224.000.

Schubart, Rudiger, to Bayer Aktiengesellschaft. Process for the selective preparation of monohydroxyalkylated amines. 4,223,138, Cl. 544-162.000.

Schueler, Marlin A., to Swingline, Inc. Low noise burster. 4,222,511, Cl. 225-100.000.

Schuler, Malcolm R.: *See—*
Gubitose, Nicholas F.; Schuler, Malcolm R.; Ronan, Harold R., Jr.; and Novak, Richard E., 4,222,502, Cl. 222-240.000.

Schuller, James J., to Pullman Incorporated. Railway hopper car closure actuating mechanism. 4,222,333, Cl. 105-250.000.

Schultz, Peter G.; and Shea, Robert H., to Eastman Kodak Company. Chucking apparatus. 4,222,214, Cl. 53-309.000.

Schulz, Donald N.; and Kang, Jung W., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituents derived from thienyl alcohols. 4,223,103, Cl. 528-168.000.

Schulz, Hans-Hermann: *See—*
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,223,114, Cl. 525-440.000.

Schulz, Heinz: *See—*
Stahlecker, Hans; and Schulz, Heinz, 4,222,225, Cl. 57-263.000.

Schulz, Helmuth: *See—*
Bacher, Helmut; and Schulz, Helmuth, 4,222,728, Cl. 425-305.100.

Schulz-Walz, Hansjochen; Hess, Bernhard; Beckers, Johannes; and Kloker, Werner, to Bayer Aktiengesellschaft. Dispersions of powders in unsaturated polyesters. 4,222,927, Cl. 260-40.00R.

Schulz-Walz, Hansjochen: *See—*
von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, 4,223,099, Cl. 525-126.000.

Schumacher, Frederick G., to Du Pont de Nemours, E. I., and Company. Blends of clay, processing oil and ethylene/vinyl ester copolymers. 4,222,924, Cl. 260-33.6UA.

Schuman, Lloyd P.: *See—*
Eme, Robert, deceased; and Schuman, Lloyd P., 4,222,624, Cl. 339-91.00R.

Schundehutte, Karl H.: *See—*
Hederich, Volker; Kruckenberg, Winfried; and Schundehutte, Karl H., 4,222,947, Cl. 260-380.000.

Schwades, Bette R.: *See—*
Ruschke, Ricky R.; and Schwades, Bette R., 4,222,407, Cl. 137-512.150.

Schwarz, Eckhard C. A., to Biax Fiberfilm Corporation. Process and product thereof for stretching a non-woven web of an orientable polymeric fiber. 4,223,059, Cl. 428-198.000.

Schweitzer Industrial Corporation: *See—*
Donahue, Joseph D., 4,222,319, Cl. 98-115.0SB.

Schweizer, Frederick A.; and Duhl, David N., to United Technologies Corporation. Single crystal nickel superalloy. 4,222,794, Cl. 148-3.000.

Schwind, Albert: *See—*
Belsky, Milan; Schwind, Albert; Winkhaus, Gunter; and Schierholt, Joseph, 4,222,989, Cl. 423-126.000.

Scientific Tools, Inc.: *See—*
Greenleaf, Robert G., 4,222,985, Cl. 422-99.000.

Scott, Charles E.: *See—*
Dewey, John L.; Scott, Charles E.; and Rushing, John C., 4,223,000, Cl. 423-631.000.

Scripps Clinic & Research Foundation: *See—*
Katz, David H., 4,222,907, Cl. 260-6.000.

Se, Tsuneyuki, to Marubeni Corporation; and Japan Fumigation Development Co., Ltd. Method for breaking a bridge of particulate and ground substances. 4,223,044, Cl. 426-318.000.

Sears, David G. Shoe insole. 4,222,182, Cl. 36-44.000.

Seddon, Richard I.: *See—*
Bergfelt, Nils H.; and Seddon, Richard I., 4,222,345, Cl. 118-720.000.

Seelbach, Walter C.: *See—*
Parkinson, Ward D.; and Seelbach, Walter C., 4,223,238, Cl. 307-297.000.

Seismograph Service Corporation: *See—*
Lerwill, William E., 4,222,455, Cl. 181-121.000.

Seitz, Gerhard: *See—*
Lerch, Joachim; and Seitz, Gerhard, 4,223,355, Cl. 358-248.000.

Sekiguchi, Yoshikazu; and Asano, Kenji, to Nippon Piston Ring Co., Ltd. Shaft seal device. 4,222,575, Cl. 277-59.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Low temperature curing epoxy ester copolymers. 4,222,912, Cl. 260-23.0EP.

Selle, Adolf K.: *See—*
Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, 4,223,089, Cl. 435-12.000.

Selwitz, Charles M.: *See—*
Sabourin, Edward T.; and Selwitz, Charles M., 4,223,172, Cl. 568-812.000.

Semenikhin, Anatoly Y.: *See—*
Kostovetsky, Semen P.; Odinokov, Boris P.; Semenikhin, Anatoly Y.; Sankov, Anatoly E.; and Soin, Vladimir V., 4,222,612, Cl. 299-11.000.

Sendo, Yuji: *See—*
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.

Seoka, Yoshio: *See—*
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.

Serinken, Nur M.: *See—*
Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., 4,223,308, Cl. 340-719.000.

Seward, Thomas P., III: *See—*
Morse, David L.; and Seward, Thomas P., III, 4,222,781, Cl. 106-47.00Q.

Sewell-Wood, Tom, to Louisville Manufacturing Co., Inc. Surface ornamented cap. 4,222,125, Cl. 2-195.000.

Sexsmith, Frederick H.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,223,115, Cl. 525-455.000.

Shabala, Stephen, to John Rouzee Green Co., The. Golf club with loft angle markings. 4,222,567, Cl. 273-167.00R.

Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,222,912, Cl. 260-23.0EP.

Shanoski, Henry; and Reichenbach, Donald F., to General Tire & Rubber Company, The. Low-shrink in-mold coating. 4,222,929, Cl. 260-40.0TN.

Shaw, David N., to Dunham-Bush, Inc. Combined pressure matching and capacity control slide valve assembly for helical screw rotary machine. 4,222,716, Cl. 417-310.000.

Shaw, Milton C., to University Patents, Inc. Static mixer. 4,222,672, Cl. 366-338.000.

Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., to Standard Oil Company (Ohio), The. Process for producing unsaturated aliphatic acids. 4,223,161, Cl. 562-534.000.

Shea, Robert H.: *See—*
Schultz, Peter G.; and Shea, Robert H., 4,222,214, Cl. 53-309.000.

Sheck, Joe S.: *See—*
Zang, Eugene E.; Sheck, Joe S.; and Calhoun, Clifford A., 4,222,693, Cl. 409-175.000.

Sheedy, James E. Apparatus and system for analyzing fixation disparity. 4,222,639, Cl. 351-4.000.

Sheffer, James B.: *See—*
Alaimo, Robert J.; Sheffer, James B.; and Millner, Ozra E., Jr., 4,222,948, Cl. 260-397.70R.

Shell Oil Company: *See—*
Mason, Ronald F.; and Devlin, Barry R. J., 4,222,936, Cl. 260-326.620.
Roman, Steven A., 4,223,155, Cl. 560-15.000.

Van Berkel, Johannes; Syrier, Johannes L. M.; and Kelderman, Hendrik C., 4,222,964, Cl. 568-420.000.

Shelton, William E. A., to Alan Shelton Limited. Yarn monitoring device. 4,222,264, Cl. 73-160.000.

Sheppard, Edward W.: *See—*
Byham, Don E.; Sheppard, Edward W.; and Chen, Catherine S. H., 4,222,881, Cl. 252-8.55D.

Sherritt Gordon Mines Limited: *See—*
Weir, Donald R.; Vosahlo, Eva A.; and Genik-Sas-Berezowsky, Roman M., 4,222,999, Cl. 423-557.000.

Shibata, Toshihiro: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; Kubota, Naohiro; and Shibata, Toshihiro, 4,222,931, Cl. 260-45.8NZ.

Shibatani, Kyoichiro; Omura, Ikuo; and Yamauchi, Junichi, to Kuraray Co., Ltd. Adhesive composition with improved bonding affinity for hard human tissues. 4,222,780, Cl. 106-35.000.

Shigematu, Syozi: *See—*
Takayama, Shuichi; Ishikawa, Takehito; Kimura, Ichiro; and Shigematu, Syozi, 4,222,765, Cl. 71-88.000.

Shimano Industrial Company, Limited: *See—*
Ishida, Takuo, 4,222,534, Cl. 242-84.20R.
Kine, Masayoshi, 4,222,285, Cl. 74-480.00R.
Noda, Hideo, 4,222,537, Cl. 242-212.000.

Shimizu, Akio, to Niles Parts Co., Ltd. Frequency dividing circuit of variable frequency dividing ratio type. 4,223,268, Cl. 328-48.000.

Shimizu, Kazuma; Nomoto, Yoshitaka; and Kariyama, Shisou, to Toyo Kogyo Co., Ltd. Corner seal means for rotary piston engines. 4,222,720, Cl. 418-121.000.

Shimizu, Kunitoshi. Process of liquefaction of coal. 4,222,849, Cl. 208-8.0LE.

Shinshu Seiki Kabushiki Kaisha: *See—*
Mori, Masahiko; Hanaoka, Seiji; and Kobayashi, Takao, 4,222,674, Cl. 400-124.000.

Shionogi & Co., Ltd.: *See—*
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.

Shiozaki, Tomoharu: *See—*
Okimoto, Tomoyuki; Shiozaki, Tomoharu; and Miyake, Makoto, 4,222,891, Cl. 252-316.000.

Shiozaki, Yasumi: *See—*
Yamada, Koichi; Harato, Takuo; and Shiozaki, Yasumi, 4,222,992, Cl. 423-242.000.

Shirakawa, Hideki: *See—*
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Shirakawa, Hideki, 4,222,903, Cl. 252-518.000.

Shiroma, Dallas M.: *See—*
Paszyc, Aleksy J.; Huang, Kwang T.; and Shiroma, Dallas M., 4,223,241, Cl. 310-308.000.

Shiseido Co., Ltd.: *See—*
Ikeda, Toshihide; Kobayashi, Toshiaki; Nakano, Motokiyo; and Tanaka, Chiaki, 4,222,908, Cl. 260-16.000.

Sholl, Howard A.; and Marshall, John T., to Dapco Industries, Inc. System for non-destructively acquiring and processing information about a test piece. 4,222,275, Cl. 73-636.000.

Short, Robert J., to Tankinetics, Inc. Method of joining together the sections of large-diameter fiberglass-reinforced tanks. 4,222,804, Cl. 156-182.000.

Shouta, Koujirou: *See—*
Nishikawa, Mineki; Kakegawa, Makoto; Iwanaga, Masayuki; and Shouta, Koujirou, 4,223,388, Cl. 364-521.000.

Shumakov, Valery I.: *See—*
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N., 4,222,386, Cl. 128-419.0PG.

Shunta, Richard F., to Anthes Imperial Limited. Liquid pump with gas separating means. 4,222,751, Cl. 55-204.000.

Shusta, George W.: *See—*
Persico, Thomas M.; Dudas, Richard M.; and Shusta, George W., 4,223,229, Cl. 250-515.000.

Shuster, Edward J.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.

Siegfried Aktiengesellschaft: *See—*
Cuny, Eckehard K. T.; and Lichtenthaler, Frieder W., 4,223,143, Cl. 544-251.000.

Siemens Aktiengesellschaft: *See—*
Adam, Jakob, 4,222,316, Cl. 98-40.0DL.
Baur, Guenter; Greubel, Waldemar; Knauer, Rudolf; and Krueger, Hans, 4,222,880, Cl. 455-617.000.
Ebert, Hans, 4,223,325, Cl. 346-145.000.
Feuerbaum, Hans P., 4,223,220, Cl. 250-310.000.
Gammel, Josef, 4,223,312, Cl. 343-117.00R.
Hartmann, Karl D., 4,223,186, Cl. 179-90.00K.
Hassler, Heinrich; Grosse, Joachim; Fischer, Gert; and Hannich, Joachim, 4,222,167, Cl. 29-875.000.
Kleinschmidt, Peter; and Meixner, Hans, 4,223,208, Cl. 219-530.000.
Lerch, Joachim; and Seitz, Gerhard, 4,223,355, Cl. 358-248.000.
Paulke, Bodo; and Walz, Alfred, 4,223,274, Cl. 330-133.000.
Rauch, Moriz v., 4,223,224, Cl. 250-442.000.
Strelow, Horst, 4,222,515, Cl. 371-68.000.
Waerve, Hans; and Djurson, Sten, 4,223,230, Cl. 250-523.000.
Zuckler, Karl, 4,223,192, Cl. 200-148.00R.

Sievers, Kirk: *See—*
Santis, Dean C.; and Sievers, Kirk, 4,223,363, Cl. 361-18.000.

SIG-Schweizerische Industrie-Gesellschaft: *See—*
Gasser, Markus, 4,222,478, Cl. 198-358.000.
Wohlfarter, Helmut, 4,222,312, Cl. 93-40.000.

Sikula, William J., Jr., to Deere & Company. Filter element shutoff valve. 4,222,875, Cl. 210-235.000.

Silva, Leziro M. Utilization of non-woven fabrics in water treatment. 4,222,877, Cl. 210-411.000.

Silvester, Austin R.: *See—*
Kurek, Harry F.; and Silvester, Austin R., 4,222,166, Cl. 29-831.000.

Silvestri, Herbert H.: *See—*
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,223,135, Cl. 544-30.000.

Simcoe, Robert J., to General Electric Company. Electronic appliance controller with flexible program and step duration capability. 4,223,379, Cl. 364-104.000.

Simeau, Bernard J. Method and apparatus for processing signals. 4,223,181, Cl. 179-1.00D.

Simjian, Luther G. Metering system. 4,222,518, Cl. 235-375.000.

Simmen, Eugene, to BBC Brown, Boveri & Company, Limited. High-impedance and wide-band voltage probe for the selective measurement of interference voltages. 4,223,265, Cl. 324-127.000.

Simmrock, Karl-Hans: *See—*
Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, 4,222,823, Cl. 20i-2.500.

Simms, John A.: *See—*
Brixius, Darryl W.; and Simms, John A., 4,222,909, Cl. 260-18.0TN.

Simon Engineering Dudley Ltd.: *See—*
Ashworth, Denis H., 4,222,457, Cl. 182-2.000.

Simon, Francois. Pulley-block weighing-balance. 4,222,551, Cl. 177-132.000.

Sims, James S., Jr.: *See—*
Holdt, Donald H.; and Sims, James S., Jr., 4,222,131, Cl. 5-79.000.

Singh, Prithipal: *See—*
Hu, Mae W.; and Singh, Prithipal, 4,223,013, Cl. 424-85.000.

Sinkovitz, Gloria D., to Calgon Corporation. Electroconductive polymers having improved solvent holdout properties. 4,222,901, Cl. 252-500.000.

Sisler, Charles C.: *See—*
Argo, Wesley B.; Crocker, Burton B.; and Sisler, Charles C., 4,222,748, Cl. 55-6.000.

Sittig, Roland, to BBC Brown, Boveri & Company, Limited. Thyristor having an anode transverse field emitter. 4,223,332, Cl. 357-38.000.

Sivertsen, Marvin L.: *See—*
Gray, David A.; Sivertsen, Marvin L.; Adam, Jerome H.; and Prendergast, John F., Sr., 4,223,222, Cl. 250-363.00S.

Sivyer Steel Corporation: *See—*
Whitney, Richard P., 4,222,530, Cl. 241-194.000.

SKF Industries, Inc.: *See—*
Mirring, Knut, 4,222,620, Cl. 308-217.000.

SKF Nova AB: *See—*
Nilsson, Sven W., 4,222,619, Cl. 308-176.000.

Skime, Roger: *See—*
Fixsen, Hubert; and Skime, Roger, 4,222,453, Cl. 180-193.000.

Skinner, Harcourt J., to Daymond Limited. Swivel couplings. 4,222,594, Cl. 285-280.000.

Slaughter, Lomis, Jr., to Anderson, Greenwood & Co. Check valve. 4,222,408, Cl. 137-518.000.

Slemmons, Charles O., to McNeil Corporation. Clock hand linkage and support assembly. 4,223,402, Cl. 368-238.000.

Slicker, James M.: *See—*
Beer, Larry D.; and Slicker, James M., 4,223,260, Cl. 318-696.000.

Slingr, Jaroslav: *See—*
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

Slovenska vedecko-technicka spolocnost, Dom techniky: *See—*
Lenorak, Ferdinand, 4,222,221, Cl. 57-58.490.

Smale, Terence C., to Beecham Group Limited. Bicyclic β-lactam antibiotics. 4,223,038, Cl. 424-274.000.

Smialek, Raymond J.: *See—*
Hirdler, Louis C.; and Smialek, Raymond J., 4,223,140, Cl. 544-192.000.

Smith, Arthur. Mill. 4,222,528, Cl. 241-46.020.

Smith, Clayton K. Adhesive tape dispenser. 4,222,509, Cl. 225-77.000.

Smith, Colin: *See—*
Wootton, Raymond J.; Walker, Kenneth E.; and Smith, Colin, 4,222,483, Cl. 198-831.000.

Smith, Curtis P.; and Temme, George H., to Upjohn Company, The. Process for preparing arylarsine substituted polystyrene. 4,223,111, Cl. 525-356.000.

Smith, Dale A., to Baxter Travenol Laboratories, Inc. Multiple blood bag having plasticizer-free portions and a high blood component survival rate. 4,222,379, Cl. 128-214.00D.

Smith, David L.; and Jamieson, John M., to Computer Microfilm International Corporation. Card selector device. 4,223,212, Cl. 235-92.0MP.

Smith, Edward H.: *See—*
Dunn, Robert E.; and Smith, Edward H., 4,222,699, Cl. 414-750.000.
Smith, Ernest L., to Phillips Petroleum Company. Method of making hermetically sealed container with frangible seal. 4,222,974, Cl. 156-272.000.
Smith, Harry: *See—*
Buckle, Derek R.; and Smith, Harry, 4,223,032, Cl. 424-258.000.
Smith, Lawrence E.: *See—*
Okinaka, Yutaka; and Smith, Lawrence E., 4,222,996, Cl. 423-371.000.
Smith, Oliver W.: *See—*
Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., 4,223,119, Cl. 528-66.000.
Smith, Raymond, to Teledyne Industries, Inc. Bearing mounting with cooling means. 4,222,705, Cl. 415-114.000.
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., to Exxon Research & Engineering Co. Autorefrigeration polymerization apparatus. 4,222,986, Cl. 422-131.000.
Smith, Teddy G.: *See—*
Olewinski, William J.; Smith, Teddy G.; and Papizan, John L., 4,222,140, Cl. 14-71.300.
Smith, Thomas W.: *See—*
Bibbee, Jeffrey N.; and Smith, Thomas W., 4,223,213, Cl. 235-92.00T.
Smolnikov, Leonid E.; Ivobotenko, Boris A.; Aparov, Adrian B.; Shumakov, Valery I.; Abasheev, Jury I.; Isachenko, Mikhail M.; and Korolev, Vladimir N. Method for stimulating cardiac action by means of implanted electrocardiostimulator and implantable electrocardiostimulator for effecting same. 4,222,386, Cl. 128-419.0PG.
SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,223,108, Cl. 525-212.000.
Snyder, Edward, III: *See—*
Tinguely, James; and Snyder, Edward, III, 4,222,558, Cl. 272-31.00A.
Snyder, Richard C.: *See—*
Rousseau, George L.; and Snyder, Richard C., 4,222,336, Cl. 105-418.000.
Societe Anonyme D.B.A.: *See—*
Duval, Andre; and Lime, Bernard, 4,222,161, Cl. 29-235.000.
Societe Anonyme des Plieuses Automatiques (SAPAL): *See—*
Pongracz, Endre, 4,222,533, Cl. 242-58.300.
Societe Anonyme Francaise du Ferodo: *See—*
Beccaris, Carlo, 4,222,470, Cl. 192-17.00A.
Brimaud, Gilbert J., 4,222,466, Cl. 188-76.000.
Fenart, Jean Claude, 4,222,475, Cl. 192-106.200.
LeBrise, Raymond, 4,222,476, Cl. 192-106.200.
Societe Anonyme pour l'Industrie Chimique: *See—*
Jaeger, Roland; and Huber, Kurt, 4,223,166, Cl. 568-779.000.
Societe d'Etudes et de Realisations Industrielles - SERI: *See—*
Lefeuvre, Antoine A. J., 4,222,871, Cl. 210-636.000.
Societe E. Lacroix: *See—*
Maury, Louis, 4,222,306, Cl. 89-1.00L.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,222,706, Cl. 415-116.000.
Drouet, Jacques L.; and Tournere, Marcel J., 4,222,707, Cl. 415-116.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Mouille, Rene L., 4,222,709, Cl. 416-134.00A.
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, to Nippon Steel Corporation. Structural steel plate highly resistant to nitrate stress corrosion cracking. 4,222,772, Cl. 75-124.000.
Soin, Vladimir V.: *See—*
Kostovetsky, Semen P.; Odinokov, Boris P.; Semenikhin, Anatoly Y.; Sankov, Anatoly E.; and Soin, Vladimir V., 4,222,612, Cl. 299-11.000.
Sokolov, Lev B.: *See—*
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.
Solid Controls, Inc.: *See—*
Rodgers, John L., Jr., 4,222,725, Cl. 425-145.000.
Solomon, Jack, to Oxford Pendaflex Corporation. Device for holding flip cards. 4,222,190, Cl. 40-530.000.
Someno, Noboru, to Sony Corporation. Multi band radio receiver system with phase locked loop. 4,223,406, Cl. 455-180.000.
Sonoda, Yoshiteru, to Fuji Kinzoku Kohsaku Co., Ltd. Automatic drain exhaust valve. 4,222,403, Cl. 137-183.000.
Sony Corporation: *See—*
Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, 4,223,344, Cl. 358-67.000.
Kishi, Yoshio, 4,223,362, Cl. 360-137.000.
Koizumi, Akio, 4,223,378, Cl. 363-26.000.
Kubota, Yukio; Noji, Keiko; and Watanabe, Yoshimi, 4,223,358, Cl. 360-75.000.
Someno, Noboru, 4,223,406, Cl. 455-180.000.
Tamaru, Hideshi; Isono, Katsuo; Sanada, Seiji; Yamagiwa, Kazuo; and Yamauchi, Toshiyuki, 4,223,338, Cl. 358-4.000.
Tsuchiya, Takao; Okada, Takashi; Ishigaki, Yoshio; and Omori, Shouji, 4,223,342, Cl. 358-37.000.
Tsujimura, Katsuhito; Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,351, Cl. 358-182.000.
Sotek Corporation: *See—*
Reitz, Norman E., 4,222,814, Cl. 156-612.000.
Sottini, Stefano: *See—*
Righini, Giancarlo; Russo, Vera; and Sottini, Stefano, 4,222,628, Cl. 350-96.110.
Spechko, John A., to Warner Electric Brake & Clutch Co. Surge control for electrical trailer brakes. 4,222,614, Cl. 303-20.000.
Specht, Steven J.; and Woodard, Kenneth E., Jr., to Olin Corporation. Internal gas separation assembly for high current density electrolytic cells. 4,222,831, Cl. 204-98.000.
Spence, Charles R.: *See—*
Wuerflein, James G.; and Spence, Charles R., 4,222,492, Cl. 212-270.000.
Spence, Kemet D.; and Andrews, Robert E., to Battelle Development Corporation. Microbial insecticide. 4,223,007, Cl. 424-16.000.
Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,222,954, Cl. 260-463.000.
Sperry Corporation: *See—*
Allen, Arnold R., 4,222,270, Cl. 73-504.000.
Bass, David S., 4,222,514, Cl. 371-27.000.
Dassele, Michael A.; Kush, Stephen T.; and Mitchell, Don E., 4,222,629, Cl. 350-96.200.
Nolt, Edwin B.; and Vansteelant, Marc G., 4,222,220, Cl. 56-343.000.
Thorsrud, Lee T., 4,223,382, Cl. 364-200.000.
Spiegel, Elwyn: *See—*
Berliner, Emanuel; Spiegel, Elwyn; and Kaneda, Nobuo, 4,222,390, Cl. 128-677.000.
Spindler, Charles W.: *See—*
Karklins, Elgin J.; and Spindler, Charles W., 4,222,805, Cl. 156-184.000.
Sprague Electric Company: *See—*
Burn, Ian, 4,223,369, Cl. 361-321.000.
Sprague, Harold G.: *See—*
Sweeney, William M.; and Sprague, Harold G., 4,222,746, Cl. 44-68.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses therefor. 4,222,941, Cl. 260-345.100.
Sprecker, Mark A.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Springer, Jerry L.; Wells, Charles M.; and Horn, William F., to Ford Motor Company. Terminal pin arrangement for an exhaust gas sensor. 4,223,293, Cl. 338-34.000.
Sprunger, Elmore V.: *See—*
Adamson, Arthur P.; and Sprunger, Elmore V., 4,222,235, Cl. 60-226.00R.
Square D Company: *See—*
Cox, Russell; Drilling, Joseph C.; and Reed, Ronald H., 4,222,627, Cl. 339-147.00R.
Lass, John L., 4,223,178, Cl. 174-65.00R.
Staheli, Paul; and Welti, Paul, to Rieter Machine Works Ltd. Fibre flock material feed apparatus for opening rolls. 4,222,154, Cl. 19-105.000.
Stahlecker, Hans; and Schulz, Heinz, to Stahlecker, Hans; and Schulz, Heinz. Open end spinning machine having piecing apparatus. 4,222,225, Cl. 57-263.000.
Standard Oil Company: *See—*
Li, George S.; and Rosen, Irving, 4,223,107, Cl. 525-206.000.
Standard Oil Company (Indiana): *See—*
Hollingsworth, Frank H.; and Mower, Lawrence N., 4,222,438, Cl. 166-250.000.
Karayannis, Nicholas M.; and Grams, Harold, 4,222,893, Cl. 252-429.00B.
Standard Oil Company (Ohio), The: *See—*
Shaw, Wilfrid G.; Milberger, Ernest C.; and Dolhyj, Serge R., 4,223,161, Cl. 562-534.000.
Stanger, Charles W., Jr.: *See—*
Hansel, John H.; Linton, Robert G.; and Stanger, Charles W., Jr., 4,222,856, Cl. 208-120.000.
Stansbury, Eric W.: *See—*
Jubb, Albert; and Stansbury, Eric W., 4,222,369, Cl. 126-438.000.
Stanulonis, John J.: *See—*
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,222,896, Cl. 252-437.000.
Stanworth, Denis R.: *See—*
Roy, Peter; Overell, Brian G.; and Stanworth, Denis R., 4,223,016, Cl. 424-177.000.
Stark, Ronald A.: *See—*
Alliegro, Richard A.; and Stark, Ronald A., 4,222,782, Cl. 106-57.000.
Start, Rick E.; Woldring, Bert; and Parker, Cliff, to Fabri-Coate Company, Inc. Continuous outflow, weight-measuring blender. 4,222,496, Cl. 222-16.000.
Stastny, Milos: *See—*
Kerr, Robert J.; and Stastny, Milos, 4,222,836, Cl. 204-180.00G.

Staubitz, Robert B.: *See*—
Tarrson, Emanuel B.; Tisma, Steven; and Staubitz, Robert B., 4,222,143, Cl. 15-105.000.

Stauffer Chemical Company: *See*—
Fancher, Llewellyn W., 4,223,028, Cl. 424-211.000.
Hahn, Alice U.; Rider, Richard H.; Scher, Herbert B.; and Hargrove, Garrard L., 4,223,070, Cl. 428-407.000.
Kim, Ki-Soo; Yu, Arthur J.; and Altscher, Siegfried, 4,223,104, Cl. 528-169.000.
Schramer, Kurt M.; and Ocampo, Don O., 4,223,054, Cl. 428-40.000.

Stauffer, John D.; Arnaudin, Edwin H., Jr.; and Chrisman, Willis L., to Anaconda Wire and Cable Company. Method for continuously making cable. 4,222,980, Cl. 264-85.000.

Staufner, Helmut. Machine for counting flat articles. 4,222,313, Cl. 93-93.00C.

Steele, Martin C.: *See*—
Bhagat, Jayant K.; and Steele, Martin C., 4,222,838, Cl. 204-192.00E.

Steigerwald, Karl H.: *See*—
Moench, Clauspeter; Scheffels, Wilhelm; Konig, Dieter; and Steigerwald, Karl H., 4,223,200, Cl. 219-121.0EB.

Steigerwald, Karl-Heinz; and Scheffels, Wilhelm, to Steigerwald Strahltechnik G.m.b.H. Charged particle beam welding with beam deflection around weld pool retainers. 4,223,199, Cl. 219-121.0EM.

Steigerwald Strahltechnik G.m.b.H.: *See*—
Moench, Clauspeter; Scheffels, Wilhelm; Konig, Dieter; and Steigerwald, Karl H., 4,223,200, Cl. 219-121.0EB.
Steigerwald, Karl-Heinz; and Scheffels, Wilhelm, 4,223,199, Cl. 219-121.0EM.

Stephens, Ralph F.: *See*—
Jones, Jerry R.; and Stephens, Ralph F., 4,222,488, Cl. 209-583.000.

Stephens, William A.: *See*—
Brown, Richard W.; Alterton, Lloyd E.; Eckerle, Joseph; Grossi, Brian J.; and Stephens, William A., 4,222,675, Cl. 400-474.000.

Sterling Drug Inc.: *See*—
Opalka, Chester J., Jr.; and Lesher, George Y., 4,223,149, Cl. 546-257.000.

Sterling, Vaughn C.: *See*—
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,223,373, Cl. 362-13.000.

Stern, Morton: *See*—
Davidson, Allen L.; Arnold, Pitt W.; and Stern, Morton, 4,223,310, Cl. 343-100.0CS.

Sternberg, George P. Preparation of yeast leavened dough products. 4,223,042, Cl. 426-20.000.

Sternberg, Shmuel; and Emmer, Steven S., to Millipore Corporation. Ultrafiltration apparatus and method. 4,222,870, Cl. 210-639.000.

Stewart, Alistair C.: *See*—
Jones, Newlyn; Stewart, Alistair C.; and Elston, Colin, 4,222,821, Cl. 162-164.00R.

Stewart, D. Fred: *See*—
King, Eugene O., Jr.; and Stewart, D. Fred, 4,222,254, Cl. 72-8.000.

Stewart, Donald M. Speed changing unit construction. 4,222,280, Cl. 474-112.000.

Stewart Stamping Corp.: *See*—
Wolfthal, Maurice, 4,222,163, Cl. 29-417.000.

Stichting Energieonderzoek Centrum Nederland: *See*—
Theyse, Frederik H., 4,223,240, Cl. 310-74.000.

Stiner, Kent P., to Gould Inc. Manually operable and shunt controllable circuit breaker. 4,223,288, Cl. 335-20.000.

Stock, Don J. R.: *See*—
Sartorius, Wilfried; and Stock, Don J. R., 4,223,267, Cl. 368-118.000.

Stolov, Michael. Image or picture projecting system using electronically controlled slides. 4,222,641, Cl. 353-84.000.

Storek, Jaroslav: *See*—
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

Stotler, David V.; and Sanders, James E., to Owens-Corning Fiberglas Corporation. Apparatus for processing filaments. 4,222,758, Cl. 65-11.00W.

Strahan, Virgil H.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,223,216, Cl. 250-226.000.

Strahan, Virgil H., Jr.: *See*—
Quick, William H.; August, Rudolf R.; James, Kenneth A.; Strahan, Virgil H., Jr.; and Nichols, Donald K., 4,223,226, Cl. 250-458.000.

Strandberg, Kerstin A. H.: *See*—
Widlund, Leif U. R.; and Strandberg, Kerstin A. H., 4,222,381, Cl. 128-270.000.

Strange, Richard R.: *See*—
Gebhart, John R.; Kinchen, Bruce E.; and Strange, Richard R., 4,222,663, Cl. 356-45.000.

Streater, Richard W.: *See*—
Baraff, David R.; Serinken, Nur M.; Miner, Carla J.; Streater, Richard W.; and Drobny, Vladimir F., 4,223,308, Cl. 340-719.000.

Strelow, Horst, to Siemens Aktiengesellschaft. Parallel digital data processing system with automatic fault recognition utilizing sequential comparators having a delay element therein. 4,222,515, Cl. 371-68.000.

Stroh, Walter: *See*—
Will, Gerhard; and Stroh, Walter, 4,222,292, Cl. 74-866.000.

Strohmaier, Ernst, to Kaltenbach & Voigt GmbH & Co. Dental handpiece and drive arrangement therefor. 4,222,738, Cl. 433-105.000.

Stroitelev, Nikolai P.: *See*—
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.

Strong, Barry C.; Marriott, Eric W.; and Clayton, William, to William Cotton Limited. Knockover bar assemblies. 4,222,248, Cl. 66-82.00R.

Stryker Corporation: *See*—
Crim, Paul E.; Richmond, James W.; and Yeomans, Thomas E., 4,222,132, Cl. 5-81.00R.

Stuber, Michael R.: *See*—
Johnston, David K.; and Stuber, Michael R., 4,222,395, Cl. 130-27.00T.

Stupak, Elliot: *See*—
Rosenkrantz, Bernard E.; and Stupak, Elliot, 4,223,022, Cl. 424-180.000.

Sturgis, Clifford M. Central heating systems furnace having a self-contained electric steam heating unit. 4,223,205, Cl. 219-365.000.

Sugiura, Itsuo: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.

Sugiyama, Hajime. Liquid level monitor apparatus. 4,223,231, Cl. 250-577.000.

Sukhanov, Stanislav V.: *See*—
Gorbunov, Boris N.; Khardin, Alexandr P.; Valdman, Alexandr I.; Rykov, Vyacheslav K.; and Sukhanov, Stanislav V., 4,222,965, Cl. 568-461.000.

Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, to Bayer Aktiengesellschaft. Process for the production of bead polymers. 4,223,114, Cl. 525-440.000.

Sumitomo Aluminium Smelting Company, Limited: *See*—
Yamada, Koichi; Harato, Takuo; and Shiozaki, Yasumi, 4,222,992, Cl. 423-242.000.

Sumitomo Chemical Company, Limited: *See*—
Sano, Takezo; Kobayashi, Akio; and Yamada, Yasuharu, 4,223,117, Cl. 526-121.000.

Sumitomo Electric Industries, Ltd.: *See*—
Moriya, Michio; and Nishiyama, Yukinori, 4,222,464, Cl. 188-73.300.

Sumitomo Metal Industries Limited: *See*—
Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, 4,222,771, Cl. 75-124.000.
Sakashita, Tsutomu; and Yamazaki, Isao, 4,222,506, Cl. 222-600.000.

Sun Trac Corporation: *See*—
Moeller, Douglas E., 4,223,174, Cl. 136-246.000.

Sundman, Frey V.: *See*—
Gullichsen, Johan; and Sundman, Frey V., 4,222,818, Cl. 162-66.000.

Sundstrand Corporation: *See*—
Huber, Melvin F.; and Hansen, Lowell D., 4,222,712, Cl. 417-204.000.

Sunkle, Thomas H.; and Cox, John M., to Owens-Corning Fiberglas Corporation. Automatic batch weighing system. 4,222,448, Cl. 177-1.000.

Suntech, Inc.: *See*—
Butte, Walter A., Jr.; Murtaugh, William J.; and Angstadt, Howard P., 4,222,961, Cl. 260-563.00D.
Myers, Harry K., Jr.; and Schneider, Abraham, 4,222,800, Cl. 149-109.600.

Super Products Corporation: *See*—
Flynn, Thomas P., 4,222,404, Cl. 137-205.000.

Supfina Maschinenfabrik Hentzen KG: *See*—
Wolff, Friedrich; Holter, Hans-Joachim; and Krumrey, Hans-Peter, 4,222,203, Cl. 51-3.000.

Supra Aktiebolag: *See*—
Lofberg, Gustaf G., 4,222,422, Cl. 150-1.000.

Suyama, Itaru, to Asahi Giken Kogyo Kabushiki Kaisha. Method for producing electric steel. 4,222,768, Cl. 75-12.000.

Suzuki, Hideo; Fujiwara, Toshihide; and Kaneko, Nobutaka, to Olympus Optical Co., Ltd. Coloring-decoloring apparatus for electrophoretic systems. 4,222,843, Cl. 204-299.00R.

Suzuki, Hiroshi: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Nakane, Masanori; and Miyake, Yoshizo, 4,222,770, Cl. 75-122.000.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,222,588, Cl. 280-804.000.

Suzuki, Kazumichi: *See*—
Takahashi, Fuminobu; Kanamori, Takahiro; and Suzuki, Kazumichi, 4,222,273, Cl. 73-603.000.

Suzuki, Kenji: *See*—
Inoue, Atsushi; Yamada, Hiromichi; and Suzuki, Kenji, 4,223,284, Cl. 333-150.000.

Svedberg-Reker, Laura J.; and Reker, Jay J. Fastening of mattress pads and the like. 4,222,139, Cl. 5-498.000.

Svoboda, Glenn R.: *See*—
Carlstrom, William L.; Reineck, Ronald W.; and Svoboda, Glenn R., 4,223,068, Cl. 428-310.000.

Swann, Brian P.: *See*—
Evans, Delme; Jolley, Michael R. J.; Ross, William J.; and Swann, Brian P., 4,222,946, Cl. 260-347.300.

Sweeney, William M.; and Sprague, Harold G., to Texaco Inc. Diesel fuel containing wax oxidates to reduce particulate emissions. 4,222,746, Cl. 44-68.000.
Sweetana, Andrew S., Jr.; Gupta, Tapan K.; Kothmann, Richard E.; and Osterhout, Joseph C., to Electric Power Research Institute, Inc. Gapless surge arrester. 4,223,366, Cl. 361-127.000.
Sweger, Theodore J.: *See*—
Jensen, Finn; and Sweger, Theodore J., 4,222,538, Cl. 248-56.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., to Gulf Research & Development Company. Magnesia-alumina-aluminum phosphate-zeolite catalyst. 4,222,896, Cl. 252-437.000.
Swingle, Ronald: *See*—
Hard, Thomas; and Swingle, Ronald, 4,222,459, Cl. 182-152.000.
Swingline, Inc.: *See*—
Schueler, Marlin A., 4,222,511, Cl. 225-100.000.
Syntron, Inc.: *See*—
Cole, Jimmy R., 4,222,340, Cl. 114-245.000.
Syrier, Johannes L. M.: *See*—
Van Berkel, Johannes; Syrier, Johannes L. M.; and Kelderman, Hendrik C., 4,222,964, Cl. 568-420.000.
Syva Company: *See*—
Hu, Mae W.; and Singh, Prithipal, 4,223,013, Cl. 424-85.000.
Tachikawa, Enzo: *See*—
Motojima, Kenji; Tachikawa, Enzo; and Kamiyama, Hideo, 4,222,892, Cl. 252-428.000.
Tachizawa, Hiroshi; and Kawano, Asaji, to Nippon Electric Co., Ltd. Long-term meter-recorder for solar cell output power. 4,222,665, Cl. 356-218.000.
Taig, Alistair G., to Bendix Corporation, The. Rack and pinion teeth configuration. 4,222,282, Cl. 74-457.000.
Takada, Juichiro. Passive vehicle occupant restraint belt system. 4,222,586, Cl. 280-803.000.
Takada, Juichiro. Seat belt anchoring device. 4,222,610, Cl. 297-483.000.
Takahara, Takeshi; Nishimura, Toshio; and Fujita, Akira, to Tokyo Shibaura Electric Co., Ltd. Gadolinium-activated phosphate phosphor. 4,222,890, Cl. 252-301.40P.
Takahashi, Fuminobu; Kanamori, Takahiro; and Suzuki, Kazumichi, to Hitachi, Ltd. Digital type ultrasonic holography apparatus. 4,222,273, Cl. 73-603.000.
Takahashi, Katsuhiko: *See*—
Imada, Yukio; and Takahashi, Katsuhiko, 4,223,091, Cl. 435-55.000.
Takahashi, Yoshikazu; Tomiyasu, Shizuo; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Titanium trichloride catalytic component and method for homo- or co-polymerization of α-olefin. 4,222,894, Cl. 252-429.00B.
Takano, Misao: *See*—
Fujii, Osamu; Takano, Misao; Uotani, Takeshi; and Iwamoto, Eiji, 4,223,152, Cl. 546-273.000.
Takano, Motoharu, to Kewpie Kabushiki Kaisha. Screw-capping device. 4,222,215, Cl. 53-331.500.
Takayama, Shuichi; Ishikawa, Takehito; Kimura, Ichiro; and Shigematu, Syozi, to Kumiai Chemical Industry Co., Ltd. Thiolcarbamic acid esters. 4,222,765, Cl. 71-88.000.
Takematsu, Yoshiyuki, to Fuji Koeki Corporation. Electric flash device. 4,223,372, Cl. 362-8.000.
Takemoto, Iwao: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.
Takeshita, Hiroshi; Nagashima, Takashi; and Kondo, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Pressure control valve assembly for brake systems. 4,222,613, Cl. 303-6.00C.
Takitani, Masaru: *See*—
Takahashi, Yoshikazu; Tomiyasu, Shizuo; and Takitani, Masaru, 4,222,894, Cl. 252-429.00B.
Tamada, Shigeharu: *See*—
Yoshizaki, Shiro; Tamada, Shigeharu; Yo, Eiyu; and Nakagawa, Kazuyuki, 4,223,137, Cl. 544-128.000.
Tamaru, Hideshi; Isono, Katsuo; Sanada, Seiji; Yamagiwa, Kazuo; and Yamauchi, Toshiyuki, to Sony Corporation. Color television receiver and VTR system. 4,223,338, Cl. 358-4.000.
Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueda, Yoshiteru, 4,222,360, Cl. 123-195.00C.
Tamura, Koichi: *See*—
Haraikawa, Tetsuo; and Tamura, Koichi, 4,222,465, Cl. 188-73.500.
Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,223,287, Cl. 333-206.000.
Tan, Ewe H.: *See*—
Wolff, Siegfried; and Tan, Ewe H., 4,222,915, Cl. 260-23.70H.
Tanaka, Chiaki: *See*—
Ikeda, Toshihide; Kobayashi, Toshiaki; Nakano, Motokiyo; and Tanaka, Chiaki, 4,222,908, Cl. 260-16.000.
Tanaka, Harumi: *See*—
Imura, Toshinori; and Tanaka, Harumi, 4,222,645, Cl. 354-51.000.
Tanaka, Hiroshi: *See*—
Tsukada, Syusei; Ando, Yujiro; and Tanaka, Hiroshi, 4,222,776, Cl. 430-55.000.
Tanaka, Shuhei: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Kubo, Masaharu; and Tanaka, Shuhei, 4,223,330, Cl. 357-32.000.
Tankinetics, Inc.: *See*—
Short, Robert J., 4,222,804, Cl. 156-182.000.
Tano, Eiichi; and Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital exposure display circuit. 4,222,644, Cl. 354-23.00D.
Tarrant, Fred A.; and Parsons, James S. Combined merchandise display, sound reproduction device and insignia supporting unit. 4,222,188, Cl. 40-152.100.
Tarrson, Emanuel B.; Tisma, Steven; and Staubitz, Robert B., to John O. Butler Company. Interproximal brush handle. 4,222,143, Cl. 15-105.000.
Taskis, Charles B., to Beecham Group Limited. Coated particles. 4,223,006, Cl. 424-16.000.
Taylor, Barry E., to Du Pont de Nemours, E. I., and Company. Na^+-conducting glass, glass-ceramic and crystalline cubic composition. 4,223,077, Cl. 429-191.000.
Taylor, David L.; and Harris, Stephen A., to Harris Corporation. Electrically alterable field effect transistor amplifier configuration. 4,223,277, Cl. 330-264.000.
TDK Electronics Company Limited: *See*—
Yoda, Minoru; and Tokuoka, Yasumichi, 4,222,798, Cl. 148-105.000.
Ted Bildplatten AEG Telefunken: *See*—
Redlich, Horst; Hartmann, Werther; and Dickopp, Gerhard, 4,223,242, Cl. 310-316.000.
Tedstone, Donald J.: *See*—
Schaum, Hans H.; Tedstone, Donald J.; Ma, Ching-Yee; and Sanderson, John J., 4,222,703, Cl. 415-53.00R.
Teichert, Allen L., to Robertshaw Controls Company. Convertible set-back selector clip. 4,223,291, Cl. 337-303.000.
Teijin Chemicals, Ltd.: *See*—
Tokuda, Toshimasa, 4,222,910, Cl. 260-18.0TN.
Teijin Limited: *See*—
Kawamura, Takeo; and Matsunaga, Teruo, 4,222,928, Cl. 260-40.00R.
Tektronix, Inc.: *See*—
Engstrom, Frederic R., 4,223,083, Cl. 430-24.000.
Teledyne Industries, Inc.: *See*—
Smith, Raymond, 4,222,705, Cl. 415-114.000.
Telford, Thomas M., to Warn Industries, Inc. Fully automatic roller locking hub. 4,222,472, Cl. 192-36.000.
Temme, George H.: *See*—
Smith, Curtis P.; and Temme, George H., 4,223,111, Cl. 525-356.000.
Temple, Davis L., Jr.: *See*—
Covington, Robert R.; Temple, Davis L., Jr.; and Yevich, Joseph P., 4,223,031, Cl. 424-251.000.
Ten Elshof, Ronald D.: *See*—
Wilson, Harold R.; and Ten Elshof, Ronald D., 4,222,542, Cl. 248-243.000.
Tenhaven, Ulrich: *See*—
Pappert, Werner; Tenhaven, Ulrich; and Wolff, Friedrich, 4,223,047, Cl. 427-32.000.
Tenneco Chemicals, Inc.: *See*—
Hiskens, Ian R.; Johnson, David C.; and Caudwell, Michael J., 4,222,820, Cl. 162-158.000.
Teodorescu, Marius C.; Mayer, Eugene P.; and Dray, Sheldon, to University of Illinois Foundation. Antibody coated bacteria. 4,223,005, Cl. 424-12.000.
Terada, Katumi, to Olympus Optical Company Ltd. Battery casing. 4,223,076, Cl. 429-96.000.
Terakura, Yukio: *See*—
Watanabe, Kazuaki; Kuramochi, Kouziro; and Terakura, Yukio, 4,222,289, Cl. 74-740.000.
Terasawa, Yoshio; Miyata, Kenji; Naito, Masayoshi; Ogawa, Takuzo; and Okamura, Masahiro, to Hitachi, Ltd. Field controlled thyristor with dual resistivity field layer. 4,223,328, Cl. 357-22.000.
Terayama, Toshiki, to Olympus Optical Co., Ltd. Celiac injector. 4,222,380, Cl. 128-216.000.
Tester, Jack R.: *See*—
Levy, Mark A.; and Tester, Jack R., 4,222,162, Cl. 29-402.090.
Tetra Pak International AB: *See*—
Andersson, Par M.; and Rosberg, Bengt A., 4,222,417, Cl. 141-392.000.
Tetu, Therese. Prosthesis brassiere. 4,222,387, Cl. 128-460.000.
Texaco Development Corp.: *See*—
Cuscurida, Michael; and Speranza, George P., 4,222,954, Cl. 260-463.000.
Watts, Lewis W., Jr.; Brader, Walter H., Jr.; Moss, Philip H.; and Yeakey, Ernest L., 4,222,957, Cl. 260-512.00R.
Texaco Inc.: *See*—
Estes, John H.; and Buinicky, Ernest P., 4,222,439, Cl. 166-272.000.
Sweeney, William M.; and Sprague, Harold G., 4,222,746, Cl. 44-68.000.
Texas Alkyls, Inc.: *See*—
Fannin, Loyd W.; and Malpass, Dennis B., 4,222,969, Cl. 260-665.00R.
Texas Instruments Incorporated: *See*—
den Brinker, Carl S., 4,223,275, Cl. 330-257.000.
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased (by Topfer, Marion, heiress), to Hamburger Stahlwerke GmbH. Method of manufacturing rolled wire rod. 4,222,257, Cl. 72-201.000.
Theodoulou, Samuel M. Body motion compensation filter with pitch and roll correction. 4,222,266, Cl. 73-179.000.
Thermo King Corporation: *See*—
Johnson, Sigvold O., 4,222,719, Cl. 418-32.000.

Theyse, Frederik H., to Stichting Energieonderzoek Centrum Nederland. Flywheel set for accumulating kinetic energy of rotation. 4,223,240, Cl. 310-74.000.
Thomas, Joseph R.: *See*—
Broughton, Roy M.; Thomas, Joseph R.; and Winters, Terence E., 4,223,124, Cl. 528-272.000.
Thompson, James W., to Microwave Semiconductor Corp. Low resistivity ohmic contacts for compound semiconductor devices. 4,223,336, Cl. 357-63.000.
Thompson, Robert: *See*—
Bellino, Ralph R.; Bellino, Michael J.; and Thompson, Robert, 4,222,284, Cl. 74-473.00R.
Thompson, Thomas K.: *See*—
Glaser, H. I.; Meyers, F. D.; Rieser, Elmer P.; and Thompson, Thomas K., 4,222,757, Cl. 65-2.000.
Thomson-CSF: *See*—
Assouline, Georges; Hareng, Michel; and Leiba, Eugene, 4,222,636, Cl. 350-350.00R.
Drabowitch, Serge, 4,223,316, Cl. 343-781.00P.
Dubois, Jean-Claude; Nguyen, Tinh H.; and Zann, Annie, 4,222,888, Cl. 252-299.000.
Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,350, Cl. 358-139.000.
Rufray, Jean-Claude, 4,223,235, Cl. 307-241.000.
Tsujimura, Katsuhito; Moutet, Louis; and Moenne-Loccoz, Jean-Marc, 4,223,351, Cl. 358-182.000.
Thomson, Wallace B., to Rockwell International Corporation. Heat storage system and method. 4,222,365, Cl. 126-400.000.
Thornburg, David D., to Xerox Corporation. Method of forming defined conductive patterns in a thin gold film. 4,223,088, Cl. 430-323.000.
Thorogood, Robert M., to Air Products and Chemicals, Inc. Tonnage nitrogen generator. 4,222,756, Cl. 62-13.000.
Thorsrud, Lee T., to Sperry Corporation. Closed loop error correct. 4,223,382, Cl. 364-200.000.
Thorvaldsen, Sverre. Bob for cast fishing. 4,222,194, Cl. 43-41.200.
Thum, Franz: *See*—
Hofer, Wolfgang O.; Kirschner, Jurgen; and Thum, Franz, 4,223,223, Cl. 250-397.000.
Thumm, Helmut, to J. M. Voith GmbH. Wood pulper with constant wood feed. 4,222,531, Cl. 241-281.000.
Tietjens, Eduard W.: *See*—
Boiten, Ebbe; Tietjens, Eduard W.; de Vries, Jochem J.; and de Vries, Tjamme, 4,222,168, Cl. 30-43.600.
Tietz, Werner, to Zeiss Ikon AG Goerzwerk. Cylinder lock with a lock picking impediment. 4,222,252, Cl. 70-364.00A.
Tijburg, Rudolf P.; and Van Dongen, Teunis, to U.S. Philips Corporation. Method of making heterojunction devices by accurate control of gold pattern mask and proton bombardment. 4,222,791, Cl. 148-1.500.
Timmermans, Robert M. G.: *See*—
Peeters, Wilhelmus M. M.; van Rhijn, Wilhelmus J.; and Timmermans, Robert M. G., 4,223,084, Cl. 430-87.000.
Tinguely, James; and Snyder, Edward, III, to Ideal Toy Corporation. Flight vehicle toy. 4,222,558, Cl. 272-31.00A.
Tisma, Steven: *See*—
Tarrson, Emanuel B.; Tisma, Steven; and Staubitz, Robert B., 4,222,143, Cl. 15-105.000.
Tjurin, Nikolai A.; Lysov, Georgy V.; Koriev, Anatoly S.; Kuznetsova, Nina L.; and Zamorenov, Anatoly T. Method and apparatus for drying granulated dielectric materials. 4,222,176, Cl. 34-1.000.
TM Invention Associates: *See*—
Castelluzzo, James M.; and Rackman, Michael I., 4,223,055, Cl. 428-40.000.
Toda, Hiromichi: *See*—
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.
Togneri, Mauro G. Rotatable and expandable chassis and cabinet. 4,223,371, Cl. 361-391.000.
Tokico Ltd.: *See*—
Haraikawa, Tetsuo; and Tamura, Koichi, 4,222,465, Cl. 188-73.500.
Tokiwa, Taisuke: *See*—
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.
Tokuda, Toshimasa, to Teijin Chemicals, Ltd. Fire-retardant polycarbonate composition. 4,222,910, Cl. 260-18.0TN.
Tokuoka, Yasumichi: *See*—
Yoda, Minoru; and Tokuoka, Yasumichi, 4,222,798, Cl. 148-105.000.
Tokyo Aircraft Instrument Co., Ltd.: *See*—
Nakamura, Shuji, 4,222,278, Cl. 74-5.500.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kinoshita, Hiroyuki, 4,223,396, Cl. 365-194.000.
Masuoka, Fujio, 4,223,333, Cl. 357-41.000.
Nagano, Katsumi, 4,223,276, Cl. 330-257.000.
Torita, Fumio, 4,222,250, Cl. 68-12.00R.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Nishikawa, Mineki; Kakegawa, Makoto; Iwanaga, Masayuki; and Shouta, Koujirou, 4,223,388, Cl. 364-521.000.
Ogura, Koichi; and Koinuma, Tokuju, 4,223,245, Cl. 315-39.510.
Takahara, Takeshi; Nishimura, Toshio; and Fujita, Akira, 4,222,890, Cl. 252-301.40P.
Toloczko, Vincent E.: *See*—
Hale, Charles R.; Toloczko, Vincent E.; Gammons, Robert C.; Eckert, Frederick J.; and Muller, John J., 4,222,808, Cl. 156-245.000.
Tomisaki, Kiyotaka: *See*—
Okuda, Masaaki; and Tomisaki, Kiyotaka, 4,222,769, Cl. 75-120.000.
Tomiyasu, Shizuo: *See*—
Takahashi, Yoshikazu; Tomiyasu, Shizuo; and Takitani, Masaru, 4,222,894, Cl. 252-429.00B.
Tomonaga, Atsushi; and Aoki, Hideki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Composite implant materials and process for preparing same. 4,222,128, Cl. 3-1.900.
Toms, John L., to Everlast World's Boxing Headquarters Corp. Boxing headguard. 4,222,122, Cl. 2-9.000.
Tomura, Teruichi: *See*—
Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, 4,223,187, Cl. 179-100.10G.
Tomy Kogyo Co., Inc.: *See*—
Ikeda, Masaki, 4,223,376, Cl. 362-112.000.
Tonelli, Roger; and Michelau, Fredrick, to Radio Steel & Mfg. Co. Coaster wagon with safety cap. 4,222,582, Cl. 280-87.02R.
Tong, George K. K. Fused light string set. 4,223,248, Cl. 315-185.00S.
Tooyama, Akira: *See*—
Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, 4,223,344, Cl. 358-67.000.
Tooyama, Takashi: *See*—
Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, 4,223,344, Cl. 358-67.000.
Topfer, Hans-Jorg, deceased: *See*—
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased, 4,222,257, Cl. 72-201.000.
Topfer, Marion, heiress: *See*—
Theis, Klaus; Forster, Eckehard; Becher, Wolfram; and Topfer, Hans-Jorg, deceased, 4,222,257, Cl. 72-201.000.
Torita, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic washing machine. 4,222,250, Cl. 68-12.00R.
Tournere, Marcel J.: *See*—
Drouet, Jacques L.; and Tournere, Marcel J., 4,222,707, Cl. 415-116.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Yoshida, Risaburo; Nagata, Hidetoshi; Naito, Michihisa; and Kaiho, Keisuke, 4,223,074, Cl. 428-469.000.
Toyo Kogyo Co., Ltd.: *See*—
Shimizu, Kazuma; Nomoto, Yoshitaka; and Kariyama, Shisou, 4,222,720, Cl. 418-121.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Fujii, Osamu; Takano, Misao; Uotani, Takeshi; and Iwamoto, Eiji, 4,223,152, Cl. 546-273.000.
Toyo Stauffer Chemical Co., Ltd.: *See*—
Takahashi, Yoshikazu; Tomiyasu, Shizuo; and Takitani, Masaru, 4,222,894, Cl. 252-429.00B.
Toyoda, Shinichi: *See*—
Sakai, Masahiko; Narahara, Toshikazu; Koyama, Toru; Toyoda, Shinichi; and Goto, Kazuo, 4,222,802, Cl. 156-53.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kohama, Tokio; Obayashi, Hideki; Ozaki, Tadashi; and Nohira, Hidetaka, 4,222,237, Cl. 60-276.000.
Ota, Isamu; and Abe, Toshihito, 4,222,357, Cl. 123-568.000.
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,222,588, Cl. 280-804.000.
Ueda, Takehito; and Sami, Hiroshi, 4,222,356, Cl. 123-568.000.
Watanabe, Kazuaki; Kuramochi, Kouziro; and Terakura, Yukio, 4,222,289, Cl. 74-740.000.
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.
Treadwell, Kenneth, to M&T Chemicals Inc. Blowing catalyst composition for low density flexible polyurethane foams. 4,223,098, Cl. 521-116.000.
Treadwell, Walter L.; and Dewing, Kenneth F., to Rigging International. Apparatus and method for moving a large object. 4,222,581, Cl. 280-81.00R.
Treffner, Charles: *See*—
Treffner, Peter; and Treffner, Charles, 4,222,299, Cl. 83-870.000.
Treffner, Peter; and Treffner, Charles. Multi-bladed cutting apparatus. 4,222,299, Cl. 83-870.000.
Trementozzi, Quirino A.: *See*—
Lee, Yoon C.; and Trementozzi, Quirino A., 4,223,096, Cl. 525-74.000.
Triebwasser, Sol, to International Business Machines Corporation. Method of fabrication of self-aligned metal-semiconductor field effect transistors. 4,222,164, Cl. 29-571.000.
Trio Kabushiki Kaisha: *See*—
Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,223,237, Cl. 307-268.000.
Tseng, Ching Y.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.
Tsubaki, Kazumi; Morinaga, Hiroshi; Iwabuchi, Takeshi; and Kawahara, Masao, to Nissan Chemical Industries, Limited. Process for producing polyethylenes. 4,223,118, Cl. 526-128.000.

Tsuchiya, Takao; Okada, Takashi; Ishigaki, Yoshio; and Omori, Shouji, to Sony Corporation. Circuit for improving the frequency characteristic of a color television signal. 4,223,342, Cl. 358-37.000.

Tsuda, Eiichi; and Mizudani, Tomihiko, to Inoue Gomu Kogyo Kabushiki Kaisha. Synthetic resin molding or trim strip. 4,223,052, Cl. 428-31.000.

Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, to Shionogi & Co., Ltd. Selective conversion of benzyl alcohol carboxylates to the free acid form. 4,223,132, Cl. 544-16.000.

Tsujimura, Katsuhito; Moutet, Louis; and Moenne-Loccoz, Jean-Marc, to Sony Corporation; and Thomson-CSF. Digitally controlled video dissolve circuit. 4,223,351, Cl. 358-182.000.

Tsukada, Syusei; Ando, Yujiro; and Tanaka, Hiroshi, to Canon Kabushiki Kaisha. Electrophotographic method. 4,222,776, Cl. 430-55.000.

Tsumura, Yukihiro: *See—*
Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, 4,223,264, Cl. 324-95.000.

Tsuzura, Junichi; and Kojima, Yukio, to Bridgestone Tire Company Limited. Lug tires with uniform base rubber gauge. 4,222,424, Cl. 152-209.00B.

Tuckerman, Louis B., III: *See—*
Konheim, Alan G.; and Tuckerman, Louis B., III, 4,223,403, Cl. 375-2.000.

Tuda, Koji: *See—*
Nagashima, Hironobu; Tuda, Koji; and Marui, Masatoshi, 4,222,394, Cl. 128-773.000.

Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A. Apparatus for measuring and correcting calibration characteristic of photoelectric aerosol analyzer. 4,222,666, Cl. 356-243.000.

Tummes, Hans: *See—*
Bexten, Ludger; Cornils, Boy; Hahn, Hans-Dieter; and Tummes, Hans, 4,222,966, Cl. 568-451.000.

Tuovinen, Frans H.; Honkaniemi, Matti E.; Virta, Matias A.; and Krogerus, Helge J., to Outokumpu Oy. Ferrochromium slag for uses requiring refractoriness and mechanical strength. 4,222,786, Cl. 106-117.000.

Turk & Bolte: *See—*
Geimer, Josef, 4,222,410, Cl. 137-606.000.

Turner, Robert E.: *See—*
Colson, Steven D.; Engelking, Paul C.; and Turner, Robert E., 4,223,278, Cl. 331-94.5PE.

Tyrey, Elasco A.; and Tyrey, Rosemary C. AM-FM and CB antenna. 4,223,314, Cl. 343-715.000.

Tyrey, Rosemary C.: *See—*
Tyrey, Elasco A.; and Tyrey, Rosemary C., 4,223,314, Cl. 343-715.000.

U.M.E.C.-Boydell (belting) Limited: *See—*
Wootton, Raymond J.; Walker, Kenneth E.; and Smith, Colin, 4,222,483, Cl. 198-831.000.

Ueda, Takehito; and Sami, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation for a diesel engine. 4,222,356, Cl. 123-568.000.

Ueda, Yoshiteru: *See—*
Fujikawa, Tetsuzo; Tamba, Shinichi; and Ueda, Yoshiteru, 4,222,360, Cl. 123-195.00C.

Ueno, Zene: *See—*
Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, 4,222,351, Cl. 123-3.000.

Uerpmann, Ernst-Peter, to Gesellschaft fur Strahler- und Umweltforschung mbH, Muunchen. Method for encasing waste barrels in a leachproof closed sheath. 4,222,889, Cl. 252-301.10R.

Uhrhan, Paul: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Schroer, Hans; and Arlt, Dieter, 4,223,147, Cl. 546-224.000.

Uitvlugt, Martin W., to Eaton Corporation. Valve disabler. 4,222,354, Cl. 123-90.160.

Ullery, Lee R.: *See—*
Erlandson, Paul M.; Ullery, Lee R.; and Brigham, Roger S., 4,223,196, Cl. 219-61.200.

Ullger, Edward J., to Century Packaging Corp. Container. 4,222,598, Cl. 294-1.00B.

Umemoto, Masuo: *See—*
Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, 4,223,187, Cl. 179-100.10G.

Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,222,659, Cl. 355-14.00R.

Union Carbide Corporation: *See—*
Davis, Robert B., 4,222,527, Cl. 241-33.000.
Hess, Lawrence G., 4,223,160, Cl. 560-209.000.
Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., 4,223,119, Cl. 528-66.000.
Vick, Steven C., 4,222,952, Cl. 556-462.000.

Union Oil Company of California: *See—*
Hackett, Gary K., 4,223,399, Cl. 367-41.000.
Hass, Robert H., 4,222,991, Cl. 423-235.000.

Uniroyal Aktiengesellschaft: *See—*
Pasch, Lambert M.; and Wagemann, Heinz, 4,222,732, Cl. 425-544.000.

Unis, Richard A.: *See—*
Noble, Wendell P., Jr.; and Unis, Richard A., 4,222,816, Cl. 156-643.000.

Uniscrew Limited: *See—*
Zimmern, Bernard, 4,222,691, Cl. 409-26.000.

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Air Force: *See—*
Cloyd, James S., 4,222,745, Cl. 23-230.00L.
Army: *See—*
Eckels, Thomas L., 4,223,180, Cl. 179-1.0SC.
Hannigan, Joseph F., 4,223,345, Cl. 358-93.000.
Howe, Philip M., 4,222,484, Cl. 206-3.000.
Johnston, James V., 4,222,271, Cl. 73-515.000.
Oliver, David W.; and Lavoo, Norman T., 4,223,243, Cl. 313-268.000.
Energy: *See—*
Ballif, John L., III; and Yuan, Wei W., 4,223,064, Cl. 428-246.000.
Health, Education & Welfare: *See—*
Boretos, John W.; and Iriguchi, Norio, 4,222,126, Cl. 3-1.500.
Interior: *See—*
Garrison, Robert L.; Gould, Rowan W.; O'Leary, Patrick J.; and Fryer, John L., 4,223,014, Cl. 424-92.000.
Larson, William C.; and Morrell, Roger J., 4,222,611, Cl. 299-4.000.
Zang, Eugene E.; Sheck, Joe S.; and Calhoun, Clifford A., 4,222,693, Cl. 409-175.000.
Navy: *See—*
Austin, Carl F., 4,222,329, Cl. 102-24.0HC.
Bakewell, Henry P., Jr.; and Johnson, Marguerite A., 4,223,397, Cl. 367-13.000.
Ellingson, Herman E., 4,223,311, Cl. 343-112.00D.
Hall, John W., 4,222,173, Cl. 33-180.00R.
Keller, Teddy M.; and Griffith, James R., 4,223,123, Cl. 528-210.000.
Parssinen, Edwin J.; and Meyers, Theodore J., 4,223,401, Cl. 367-168.000.
Paszyc, Aleksy J.; Huang, Kwang T.; and Shiroma, Dallas M., 4,223,241, Cl. 310-308.000.
Zalesak, Joseph F.; and Robinson, A. Zed, 4,223,400, Cl. 367-135.000.

U.S. Philips Corporation: *See—*
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Bouwhuis, Gijsbertus; and Kramer, Pieter, 4,223,347, Cl. 358-128.500.
Daenen, Theo E. G., 4,222,827, Cl. 204-14.00N.
de Boer, Eeltje, 4,223,282, Cl. 332-10.000.
Hennings, Detlev; and Schreinemacher, Herbert, 4,222,885, Cl. 252-63.200.
Jacobs, Cornelis A. J.; and Rozenboom, Jaap, 4,223,247, Cl. 315-57.000.
Koorneef, Jacob, 4,222,159, Cl. 29-25.140.
Renelt, Gerhard; and Rothgordt, Ulf, 4,223,356, Cl. 358-261.000.
Tijburg, Rudolf P.; and Van Dongen, Teunis, 4,222,791, Cl. 148-1.500.
van Nes, Johannes C. A.; and van Heek, Herman F., 4,222,642, Cl. 354-1.000.

United States Surgical Corporation: *See—*
Rawson, Paul O.; Nagy, Louis E.; and Veth, George J., 4,222,391, Cl. 128-736.000.

United Technologies Corporation: *See—*
Gebhart, John R.; Kinchen, Bruce E.; and Strange, Richard R., 4,222,663, Cl. 356-45.000.
Peters, George T.; and Lonning, Kjell, 4,223,201, Cl. 219-121.0LC.
Peters, George T.; and Banas, Conrad M., 4,223,202, Cl. 219-121.00L.
Robinson, Ronald L., 4,222,232, Cl. 60-737.000.
Schweizer, Frederick A.; and Duhl, David N., 4,222,794, Cl. 148-3.000.

Unitika Ltd: *See—*
Amemiya, Kunio; Nishimura, Motohiro; and Kimura, Yoichi, 4,223,065, Cl. 428-272.000.

Universal Matthey Products France: *See—*
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University of Illinois Foundation: *See—*
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University of Minnesota, The Regents of the: *See—*
Vince, Robert, 4,223,156, Cl. 560-20.000.

University of Toronto, The Governing Council of the: *See—*
Hsia, Jen C.; Le Blanc, Arthur E.; and Marshman, Joan A., 4,223,004, Cl. 424-9.000.

University Patents, Inc.: *See—*
Heeger, Alan J.; MacDiarmid, Alan G.; Chiang, Chwan K.; and Shirakawa, Hideki, 4,222,903, Cl. 252-518.000.
Shaw, Milton C., 4,222,672, Cl. 366-338.000.

Untereker, Darrel F.: *See—*
Phillips, Gary M.; and Untereker, Darrel F., 4,223,110, Cl. 525-356.000.

Uotani, Takeshi: *See—*
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Upchurch, Edward F.: *See—*
Smith, Stuart B.; McAlpin, James J.; Peruyero, Jose M. A.; Hazelton, Ronald L.; and Upchurch, Edward F., 4,222,986, Cl. 422-131.000.

Upjohn Company, The: *See—*
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Smith, Curtis P.; and Temme, George H., 4,223,111, Cl. 525-356.000.

Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,223,092, Cl. 435-55.000.

Upton, Charles J.: *See—*
Crutchfield, Marvin M.; Lannert, Kent P.; and Upton, Charles J., 4,223,162, Cl. 562-583.000.

Upton Industries, Inc.: *See—*
Bassett, Leslie, 4,222,554, Cl. 266-120.000.

Uram, Robert, to Westinghouse Electric Corp. Multiple turbine electric power plant having a coordinated control system with improved flexibility. 4,222,229, Cl. 60-39.030.

Urano, Fumio; and Kobayashi, Takumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera film rewinding device. 4,222,651, Cl. 354-214.000.

Usami, Nobuo, to Nihon Bed Manufacturing Company, Ltd. Internal pressure adjustable bed. 4,222,137, Cl. 5-446.000.

Ushimaru, Akira: *See—*
Nakajima, Yosuke; Ushimaru, Akira; Kishimoto, Shinzo; Seoka, Yoshio; Kawai, Masayoshi; Chino, Naoyoshi; Hoshi, Yoshiyuki; and Hasebee, Kazunori, 4,222,777, Cl. 430-363.000.

Uyeda, Tim M., to Gartner, Klaus W.; and Phillips, Peter J., a part interest. Additional locking system for combination lock. 4,222,251, Cl. 70-1.500.

Vacval, Dusan M.: *See—*
Domes, E. A.; and Vacval, Dusan M., 4,222,463, Cl. 188-72.300.

Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I. Reduction unit of drilling motor. 4,222,445, Cl. 175-106.000.

Valdez, Arthur F. Magnetic pickup arrangement for stringed musical instrument. 4,222,301, Cl. 84-1.150.

Valdman, Alexandr I.: *See—*
Gorbunov, Boris N.; Khardin, Alexandr P.; Valdman, Alexandr I.; Rykov, Vyacheslav K.; and Sukhanov, Stanislav V., 4,222,965, Cl. 568-461.000.

Valentino, Pearl T. Training foot stool. 4,222,136, Cl. 5-443.000.

Valeri, William J.; and Burkes, Daniel O., to Irathane Systems Incorporated. Trommel screen unit. 4,222,865, Cl. 209-399.000.

Valeron Corporation, The: *See—*
Beer, Larry D.; and Slicker, James M., 4,223,260, Cl. 318-696.000.

Van Berkel, Johannes; Syrier, Johannes L. M.; and Kelderman, Hendrik C., to Shell Oil Company. 2-(2,2-Dihalovinyl-3,3-dimethylcyclopropyl)ethanal. 4,222,964, Cl. 568-420.000.

van der Lely, Ary: *See—*
van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis J. G., 4,222,441, Cl. 172-59.000.

van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N. V. Agricultural implements. 4,222,441, Cl. 172-59.000.

van der Schoot, Peter W. C., to Goudsche Machinefabriek B.V. Peeling device. 4,222,322, Cl. 99-467.000.

Van Dongen, Teunis: *See—*
Tijburg, Rudolf P.; and Van Dongen, Teunis, 4,222,791, Cl. 148-1.500.

Van Eenam, Donald N., to Monsanto Company. Polyamine/epihalohydrin reaction products. 4,222,921, Cl. 260-29.60H.

van Heek, Herman F.: *See—*
van Nes, Johannes C. A.; and van Heek, Herman F., 4,222,642, Cl. 354-1.000.

van Hullen, Kurt, to Niederrheinische Maschinenfabrik Becker & van Hullen. Multi-platen press for pressing chipboards and the like without spacer strips. 4,222,724, Cl. 425-141.000.

van Koten, Gerard: *See—*
Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, 4,222,898, Cl. 252-447.000.

van Nes, Johannes C. A.; and van Heek, Herman F., to U.S. Philips Corporation. Exposure device for the manufacture of cathode-ray tubes for displaying colored pictures and cathode-ray tube manufactured by means of such a device. 4,222,642, Cl. 354-1.000.

Vano, Gerald L., to Alden Research Foundation. Facsimile recorder with sweep rate detection. 4,223,357, Cl. 358-264.000.

van Raamsdonk, Cornelis, to Olympia Werke AG. Maintaining the nozzle surface of an ink writing head. 4,223,322, Cl. 346-140.00R.

van Rhijn, Wilhelmus J.: *See—*
Peeters, Wilhelmus M. M.; van Rhijn, Wilhelmus J.; and Timmermans, Robert M. G., 4,223,084, Cl. 430-87.000.

Vansteelant, Marc G.: *See—*
Nolt, Edwin B.; and Vansteelant, Marc G., 4,222,220, Cl. 56-343.000.

Varian Associates, Inc.: *See—*
Achener, Pierre Y., 4,222,414, Cl. 138-30.000.

Vaseen, V. A. Horizontal rotating drum fermentor. 4,223,094, Cl. 435-312.000.

Vasek, Jaroslav, to Vedecko vyzkumny uhelny ustav. Cutter with cutter holder for disintegrating of material, particularly of rock. 4,222,446, Cl. 175-329.000.

Vasiliev, Jury S.: *See—*
Vadetsky, Jury V.; Derkach, Nikolai D.; Krutik, Ernst N.; Chudakov, Georgy F.; Stroitelev, Nikolai P.; Natarov, Alexandr P.; Vasiliev, Jury S.; Andoskin, Vladimir N.; and Ivanov, Evgeny I., 4,222,445, Cl. 175-106.000.

Vasiliev, Vitaly A.: *See—*
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.

Vedecko vyzkumny uhelny ustav: *See—*
Vasek, Jaroslav, 4,222,446, Cl. 175-329.000.

Verduin, Lee C., to Rowe International, Inc. Electronic vending machine selection counter. 4,223,210, Cl. 235-92.0AC.

Vernieres, Jean-Claude: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Combet epse Broll, Madeleine; and Lacolle, Jean-Yves, 4,223,041, Cl. 424-322.000.

Vernon, Jack A.: *See—*
Hocks, Robert W.; and Vernon, Jack A., 4,222,393, Cl. 128-746.000.

Verreau, Bernard J.: *See—*
Antonaccio, Joseph C.; and Verreau, Bernard J., 4,223,380, Cl. 364-200.000.

Veth, George J.: *See—*
Rawson, Paul O.; Nagy, Louis E.; and Veth, George J., 4,222,391, Cl. 128-736.000.

Vick, Steven C., to Union Carbide Corporation. Siloxane bond rearrangement effected by solid perfluorinated polymers containing pendant sulfonic acid groups. 4,222,952, Cl. 556-462.000.

Vickers Limited: *See—*
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,222,262, Cl. 73-81.000.

Vilain, Robert, to Enterprise d'Equipments Mechaniques et Hydrauliques, E.M.H. Platforms for sea-bottom exploitation. 4,222,682, Cl. 405-203.000.

Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,223,168, Cl. 568-345.000.

Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,222,941, Cl. 260-345.100.

Vince, Robert, to University of Minnesota, The Regents of the. Adenosine deaminase resistant antiviral purine nucleosides and method of preparation. 4,223,156, Cl. 560-20.000.

Virta, Matias A.: *See—*
Tuovinen, Frans H.; Honkaniemi, Matti E.; Virta, Matias A.; and Krogerus, Helge J., 4,222,786, Cl. 106-117.000.

Visual Methods, Inc.: *See—*
Kruegle, Herman, 4,222,662, Cl. 355-40.000.

Vitalograph (Ireland) Limited: *See—*
Allsen, Philip E.; and Hafen, Brent Q., 4,223,211, Cl. 235-92.0DN.

Vitau, Jean. Setting for precious stones or the like and a method for mounting precious stones or the like in a setting. 4,222,245, Cl. 63-28.000.

Vitellaro, Daniel F.: *See—*
Nuzzi, Francis J.; and Vitellaro, Daniel F., 4,222,778, Cl. 106-1.110.

Vits, Hilmar, to VITS-Maschinenbau GmbH. Device for removing a stack of sheets of paper. 4,222,697, Cl. 414-50.000.

VITS-Maschinenbau GmbH: *See—*
Vits, Hilmar, 4,222,697, Cl. 414-50.000.

Vlasov, Sergei N.: *See—*
Khodosh, Vladimir A.; Ivanov, Valentin A.; Lugovtsov, Anatoly S.; Alikhashkin, Vladimir A.; Mozhaev, Arkady I.; Vlasov, Sergei N.; Kartsev, Alexei K.; Fishman, Iosif D. Y.; and Grigoriev, Ivan N., 4,222,681, Cl. 405-141.000.

Vock, Manfred H.: *See—*
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Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,223,046, Cl. 426-538.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,222,941, Cl. 260-345.100.

Voest-Alpine Aktiengesellschaft: *See—*
Scheurecker, Werner, 4,222,432, Cl. 164-446.000.

Volkers, Stewart W.: *See—*
Hagenbach, Robert J.; Forgensi, Rudolph; Volkers, Stewart W.; and Di Orazio, Dennis F., 4,223,085, Cl. 430-108.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Hofbauer, Peter, 4,222,358, Cl. 123-495.000.

von Harpe, Hannes; Bottenbruch, Ludwig; Peltzer, Bernd; Morbitzer, Leo; Korber, Helmut; and Schulz-Walz, Hansjochen, to Bayer Aktiengesellschaft. Copolymerizable molding compositions based on unsaturated polyurethanes. 4,223,099, Cl. 525-126.000.

Vorhis, Frederick H., Jr.; and Bishop, Keith C., III, to Chevron Research Company. Catalytic reforming of naphtha fractions. 4,222,854, Cl. 208-80.000.

Vosahlo, Eva A.: *See—*
Weir, Donald R.; Vosahlo, Eva A.; and Genik-Sas-Berezowsky, Roman M., 4,222,999, Cl. 423-557.000.

Voss Steel Corporation: *See—*
Beecher, Brazier K., 4,222,997, Cl. 423-481.000.

Vyzkumny ustav bavlnarsky: *See—*
Didek, Stanislav; Fajt, Ludvik; Storek, Jaroslav; Slingr, Jaroslav; Cada, Frantisek; and Markova, Marie, 4,222,222, Cl. 57-58.950.

W. R. Grace & Co.: *See—*
Bellino, Ralph R.; Bellino, Michael J.; and Thompson, Robert, 4,222,284, Cl. 74-473.00R.
Hill, Richard N., 4,222,879, Cl. 210-520.000.
W. Schlafhorst & Co.: *See—*
Raasch, Hans, 4,222,224, Cl. 57-263.000.
Wacker-Chemie GmbH: *See—*
August, Peter; Hechtl, Wolfgang; and Schmidlkofer, Richard, 4,222,983, Cl. 264-220.000.
Wada, Fumio: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,222,963, Cl. 568-384.000.
Wada, Shigetaka: *See—*
Atsumi, Senji; and Wada, Shigetaka, 4,222,783, Cl. 106-73.320.
Waerve, Hans; and Djurson, Sten, to Siemens Aktiengesellschaft. X-Ray examination apparatus. 4,223,230, Cl. 250-523.000.
Wagemann, Heinz: *See—*
Pasch, Lambert M.; and Wagemann, Heinz, 4,222,732, Cl. 425-544.000.
Wagman, Gerald H.: *See—*
Weinstein, Marvin J.; Wagman, Gerald H.; Marquez, Joseph A.; and Patel, Mahesh G., 4,223,130, Cl. 536-17.00R.
Wahli, Robert; and Pinkert, Jurgen, to Gretag Aktiengesellschaft. Process and apparatus for printing transparencies. 4,222,661, Cl. 355-38.000.
Waibel, Helmut K.: *See—*
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Wake, Robert H.: *See—*
Keller, John T.; and Wake, Robert H., 4,223,353, Cl. 358-230.000.
Walker, Bertice E., Jr.: *See—*
Ang, Leoncio T.; Walker, Bertice E., Jr.; and Weber, Robert E., 4,222,615, Cl. 303-92.000.
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., to Bristol-Myers Company. Production of cephalosporins. 4,223,135, Cl. 544-30.000.
Walker, Kenneth E.: *See—*
Wootton, Raymond J.; Walker, Kenneth E.; and Smith, Colin, 4,222,483, Cl. 198-831.000.
Walker, Sanders B., Jr. Portable equipment stand. 4,222,546, Cl. 248-676.000.
Walkowiak, Michael: *See—*
Suling, Carlhans; Balle, Gerhard; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,223,114, Cl. 525-440.000.
Wallace, Joseph W.: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,222,494, Cl. 220-66.000.
Walser, Donald C.; and McLauchlan, Thomas A., to Canadian Patents & Development Ltd. Pressure bar for veneer cutting. 4,222,421, Cl. 144-325.000.
Walz, Alfred: *See—*
Paulke, Bodo; and Walz, Alfred, 4,223,274, Cl. 330-133.000.
Wandel & Goltermann GmbH & Co.: *See—*
Feistel, Karl H., 4,223,272, Cl. 330-51.000.
Wang Laboratories, Inc.: *See—*
Wu, Edward S., 4,222,557, Cl. 271-4.000.
Wang, Wei-Kung. Method and apparatus for detecting biological particles by fluorescent stain. 4,222,743, Cl. 23-230.00B.
Ward, Frederick W. A., to Wean United, Inc. Industrial workpiece transporting car system. 4,222,694, Cl. 410-45.000.
Wardman, John C.; and Adams, James Y. Solar and wind energized power generation device. 4,222,241, Cl. 60-641.000.
Warman International Limited: *See—*
Buckle, Thomas G.; and Bellingham, Andrew I., 4,222,998, Cl. 423-491.000.
Warn Industries, Inc.: *See—*
Telford, Thomas M., 4,222,472, Cl. 192-36.000.
Warner Electric Brake & Clutch Co.: *See—*
Spechko, John A., 4,222,614, Cl. 303-20.000.
Warolin, Christian J. M.: *See—*
Rose, Francis E. E.; Warolin, Christian J. M.; Muller, Pierre; Fabiani, Paul M. P.; and Gaudilliere, Bernard, 4,223,039, Cl. 424-275.000.
Warren, James C. Sound dampening earplug mounting device. 4,223,189, Cl. 179-182.00R.
Warshawsky, Jerome, to I. W. Industries, Inc. Detachable finial lamp part. 4,223,051, Cl. 428-28.000.
Wasa, Kiyotaka: *See—*
Ono, Shusuke; Ohji, Kenzo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,223,286, Cl. 333-195.000.
Washecheck, Paul H.: *See—*
Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., 4,223,164, Cl. 568-618.000.
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Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,222,643, Cl. 354-7.000.
Watanabe, Atsumi: *See—*
Iyotani, Ryuji; and Watanabe, Atsumi, 4,223,236, Cl. 307-252.00Q.
Watanabe, Kazuaki; Kuramochi, Kouziro; and Terakura, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission with overdrive. 4,222,289, Cl. 74-740.000.
Watanabe, Toshiro: *See—*
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,222,522, Cl. 239-160.000.
Watanabe, Yoshimi: *See—*
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Watermann, Willy: *See—*
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Watts, Lewis W., Jr.; Brader, Walter H., Jr.; Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corp. Process of purifying ether sulfonates. 4,222,957, Cl. 260-512.00R.
Wean United, Inc.: *See—*
Ward, Frederick W. A., 4,222,694, Cl. 410-45.000.
Weber, Helmut: *See—*
Bader, Leonhard; Giessner, Frank; and Weber, Helmut, 4,223,323, Cl. 346-140.00R.
Weber, Herb: *See—*
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Weber, Robert E.: *See—*
Ang, Leoncio T.; Walker, Bertice E., Jr.; and Weber, Robert E., 4,222,615, Cl. 303-92.000.
Webster, Donald A.; Johnson, Lake H.; and Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Centrifuge tube seal. 4,222,513, Cl. 233-26.000.
Wechsberg, Manfred; and Schonbeck, Rupert, to Chemie Linz Aktiengesellschaft. Process for the manufacture of α-hydroxycarboxylic acid amides. 4,222,960, Cl. 260-559.00R.
Wehr Corporation: *See—*
Savage, William T., 4,222,726, Cl. 425-195.000.
Wei, Yung-Kang: *See—*
Briggs, George J.; and Wei, Yung-Kang, 4,222,906, Cl. 260-5.000.
Weimann, Klaus: *See—*
Muller, Elmar; and Weimann, Klaus, 4,223,331, Cl. 357-38.000.
Weinroth, Lois L.: *See—*
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Weinstein, Marvin J.; Wagman, Gerald H.; Marquez, Joseph A.; and Patel, Mahesh G., to Schering Corporation. Antibiotic 67-121, a polyene antifungal antibiotic produced by *Actinoplanes caeruleus*. 4,223,130, Cl. 536-17.00R.
Weir, Donald R.; Vosahlo, Eva A.; and Genik-Sas-Berezowsky, Roman M., to Sherritt Gordon Mines Limited; and Cominco Ltd. Removal of selenium from sulphate solutions. 4,222,999, Cl. 423-557.000.
Weirich, James F., to Dunbar, John P. Vent block with pressed-in screen. 4,222,315, Cl. 98-37.000.
Weiss, Gerald M.: *See—*
Whitney, Edward A.; and Weiss, Gerald M., 4,222,741, Cl. 8-94.160.
Wella Aktiengesellschaft: *See—*
Hildebrandt, Bodo, 4,222,525, Cl. 239-343.000.
Wells, Charles M.: *See—*
Springer, Jerry L.; Wells, Charles M.; and Horn, William F., 4,223,293, Cl. 338-34.000.
Welti, Paul: *See—*
Staheli, Paul; and Welti, Paul, 4,222,154, Cl. 19-105.000.
Wenzel, Werner, to NUSTEP Trenndusen Entwickfungs- und Patentverwertungsgesellschaft mbH & Co. KG. Apparatus for the separation of isotopes by the separating nozzle process. 4,222,752, Cl. 55-269.000.
Werner, Peter: *See—*
Drews, Ulrich; Werner, Peter; Moder, Helmut; and Kugelmann, Adolf, 4,222,352, Cl. 123-484.000.
Werner, Wolfgang: *See—*
Rothe, Anselm; Selle, Adolf K.; Lange, Hans-Rudolf; Rittersdorf, Walter; and Werner, Wolfgang, 4,223,089, Cl. 435-12.000.
West, Robert D. Prime focus camera for telescope. 4,222,646, Cl. 354-79.000.
Westcott, Lawrence: *See—*
Raine, Paul R.; and Westcott, Lawrence, 4,223,060, Cl. 428-199.000.
Westendorf, Neal W.; and Langenfeld, Joseph W. Method and apparatus for power mounting an implement on a tractor. 4,222,442, Cl. 172-273.000.
Western Electric Company, Inc.: *See—*
Bacon, Duane E.; Gattermeir, J. David; and Hrivnak, Bonnie J., 4,222,834, Cl. 204-129.600.
Jones, Jerry R.; and Stephens, Ralph F., 4,222,488, Cl. 209-583.000.
Western Gear Corporation: *See—*
Larsen, Charles H.; and Heeres, Cornelis J., 4,222,341, Cl. 114-264.000.
Western Litho Plate & Supply Co.: *See—*
Harrell, Robert E.; and Harrell, Tedd L., 4,222,656, Cl. 354-317.000.
Westinghouse Electric Corp.: *See—*
Calvino, Ben J., 4,223,191, Cl. 200-145.000.
Dixon, George D., 4,222,835, Cl. 204-159.160.
Dunn, Robert E.; and Smith, Edward H., 4,222,699, Cl. 414-750.000.
Immel, Ralph B., 4,223,289, Cl. 335-202.000.
King, William E.; and Calhoun, Gregory L., 4,222,540, Cl. 248-205.00R.
Miller, William R.; and Peck, Clarence E., 4,223,385, Cl. .364-472.000.
Mueller, Norman P.; Rossi, Charles E.; and Scherpereel, Lawrence R., 4,222,822, Cl. 176-20.00R.
Uram, Robert, 4,222,229, Cl. 60-39.030.
Westvaco Corporation: *See—*
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Wheeler, Walter M.: *See*—
White, James E.; Gulette, Ronald S.; and Wheeler, Walter M., 4,222,601, Cl. 296-37.160.

White Consolidated Industries, Inc.: *See*—
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White, James E.; Gulette, Ronald S.; and Wheeler, Walter M., to Irvin Industries Inc. Automobile compartment cover. 4,222,601, Cl. 296-37.160.

White, Kevin E., to Exxon Research & Engineering Co. Multi-phase synchronous machine system. 4,223,261, Cl. 318-721.000.

White Metal Rolling and Stamping Corp.: *See*—
Larson, Clayton E., 4,222,460, Cl. 182-211.000.

Whitfield, Thomas M.: *See*—
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,222,979, Cl. 264-75.000.

Whitney, Edward A.; and Weiss, Gerald M., to Dubuque Packing Company. Method of processing mechanically removed porcine skins for ultimate gelatin or leather production. 4,222,741, Cl. 8-94.160.

Whitney, Richard P., to Sivyer Steel Corporation. Replaceable protective means for end disc of shredder. 4,222,530, Cl. 241-194.000.

Whitten, Hubert N. Game device. 4,222,561, Cl. 273-1.00R.

Wichmann, Joseph K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,223,131, Cl. 542-428.000.

Wickbold, Reinhold; Muller, Wolfgang H. E.; Regner, Hans; Scharein, Gunter; Langheim, Franz; Ruthemeier, Rolf; Simmrock, Karl-Hans; and Baumann, Rolf, to Chemische Werke Huis Aktiengesellschaft. Method for processing chlorinated hydrocarbon residues. 4,222,823, Cl. 201-2.500.

Widlund, Leif U. R.; and Strandberg, Kerstin A. H., to Molnlycke AB. Menstrual tampon. 4,222,381, Cl. 128-270.000.

Wier, Larry: *See*—
Murray, Royce W.; Moses, P. R.; and Wier, Larry, 4,223,049, Cl. 427-126.000.

Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Polyalkyl-piperidine diols and process for their preparation. 4,223,148, Cl. 546-242.000.

Wiggins Teape Limited: *See*—
Raine, Paul R.; and Westcott, Lawrence, 4,223,060, Cl. 428-199.000.

Wikel, James H.: *See*—
Lappas, Lewis C.; Lorenz, Leslie J.; and Wikel, James H., 4,223,153, Cl. 548-163.000.

Wiklund, Klas R., to AGA Aktiebolag. Electro mechanical position indicator using relatively moveable coils. 4,223,300, Cl. 340-196.000.

Wilkin, Geoffrey A.: *See*—
Batie, John N.; Relf, Graham T.; and Wilkin, Geoffrey A., 4,222,262, Cl. 73-81.000.

Wilkinson Sword Limited: *See*—
Pointon, Peter C., 4,222,196, Cl. 47-27.000.

Will, Gerhard; and Stroh, Walter, to Robert Bosch GmbH. Method and apparatus for reducing jolt in vehicle automatic transmissions. 4,222,292, Cl. 74-866.000.

William Beaumont Hospital: *See*—
Horwitz, Norman H., 4,223,227, Cl. 250-491.000.

William Cotton Limited: *See*—
Strong, Barry C.; Marriott, Eric W.; and Clayton, William, 4,222,248, Cl. 66-82.00R.

Williams, Henry. Electra brick. 4,223,377, Cl. 362-145.000.

Williams, John W., to Factory Mutual Research Corporation. Dual overlapping fire protection systems and valve. 4,222,402, Cl. 137-87.000.

Williams, Richard L. Apparatus for boring sewer pipe opening in manhole base. 4,222,687, Cl. 408-79.000.

Willis, Brian J.; Christenson, Philip A.; and Barton, Derek H. R., to Fritzsche Dodge & Olcott Inc. Processes for preparing β-santalol, β-santalene dihydro-β-santalol and related compounds. 4,223,167, Cl. 568-820.000.

Willis, J. Don. Refuse collecting device. 4,222,597, Cl. 294-1.0BA.

Wilson, Alan D.: *See*—
Crisp, Stephen; and Wilson, Alan D., 4,222,920, Cl. 260-29.60M.

Wilson, Harold R.; and Ten Elshof, Ronald D., to Haworth Mfg., Inc. End panel mount with safety lock. 4,222,542, Cl. 248-243.000.

Wilson, Wade. Filter box. 4,222,866, Cl. 209-417.000.

Winkhaus, Gunter: *See*—
Belsky, Milan; Schwind, Albert; Winkhaus, Gunter; and Schierholt, Joseph, 4,222,989, Cl. 423-126.000.

Winter, Karl, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitting machine with compound needles. 4,222,249, Cl. 66-120.000.

Winters, Terence E.: *See*—
Broughton, Roy M.; Thomas, Joseph R.; and Winters, Terence E., 4,223,124, Cl. 528-272.000.

Winz, Hans: *See*—
Gotz, Hans; Hack, Albert; and Winz, Hans, 4,222,314, Cl. 98-2.180.

Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,223,131, Cl. 542-428.000.

Wohlberg, Alfred W.: *See*—
Hansen, Charles M., Jr.; and Wohlberg, Alfred W., 4,223,263, Cl. 322-47.000.

Wohlfarter, Helmut, to SIG-Schweizerische Industrie-Gesellschaft. Apparatus for making lined containers. 4,222,312, Cl. 93-40.000.

Woldring, Bert: *See*—
Start, Rick E.; Woldring, Bert; and Parker, Cliff, 4,222,496, Cl. 222-16.000.

Wolff, Friedrich; Holter, Hans-Joachim; and Krumrey, Hans-Peter, to Supfina Maschinenfabrik Hentzen KG. Machining device and method. 4,222,203, Cl. 51-3.000.

Wolff, Friedrich: *See*—
Pappert, Werner; Tenhaven, Ulrich; and Wolff, Friedrich, 4,223,047, Cl. 427-32.000.

Wolff, Siegfried; and Tan, Ewe H., to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Vulcanizable halorubber mixtures. 4,222,915, Cl. 260-23.70H.

Wolfthal, Maurice, to Stewart Stamping Corp. Method for automatically assembling articles, such as clips. 4,222,163, Cl. 29-417.000.

Wolgemuth, Richard L., to Adria Laboratories Inc. Calcium salts of divinyl ether—maleic anhydride copolymer. 4,223,109, Cl. 525-327.000.

Wong, Herman: *See*—
Lloyd, William A.; Wong, Herman; and McFarland, Keith E., 4,222,497, Cl. 222-57.000.

Wood, Kenneth O.: *See*—
Anderson, Verner; Logan, David J.; and Wood, Kenneth O., 4,222,396, Cl. 131-105.000.

Wood, Theodore N., Jr. Apparatus for storing skis. 4,222,490, Cl. 211-60.0SK.

Woodard, Kenneth E., Jr.: *See*—
Specht, Steven J.; and Woodard, Kenneth E., Jr., 4,222,831, Cl. 204-98.000.

Woodford, Maurice C.: *See*—
O'Hanlon, Peter J.; Woodford, Maurice C.; and Rogers, Norman H., 4,222,942, Cl. 260-345.80R.

Woolard, James M.: *See*—
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,222,494, Cl. 220-66.000.

Wootton, Raymond J.; Walker, Kenneth E.; and Smith, Colin, to U.M.E.C.-Boydell (belting) Limited. Belt conveyors. 4,222,483, Cl. 198-831.000.

Worldwide Blast Cleaning Limited: *See*—
Lake, Charles W.; and Weber, Herb, 4,222,205, Cl. 51-420.000.

Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., to Upjohn Company, The. Process for preparing 9α-OH BN acid methyl ester. 4,223,092, Cl. 435-55.000.

Wright, Ian G., to Eli Lilly and Company. Process for preparing cephalosporin antibiotics. 4,223,134, Cl. 544-26.000.

Wright, Otis L. Rear-loading dual mode furnace. 4,222,364, Cl. 126-111.000.

WSP Industries Corporation: *See*—
McDermott, Richard P., 4,222,260, Cl. 72-345.000.

Wu, Edward S., to Wang Laboratories, Inc. Printer feeding and stacking. 4,222,557, Cl. 271-4.000.

Wuerflein, James G.; and Spence, Charles R., to Burro-Badger Corporation. Method for extending a boom assembly. 4,222,492, Cl. 212-270.000.

Wulf, Gunter, to Hermann Waldner GmbH & Co. Shut-off valve. 4,222,413, Cl. 137-637.300.

Wurttembergische Parfumerie-Fabrik GmbH: *See*—
Scheller, Hans-Ulrich, 4,223,003, Cl. 424-7.000.

Wusirika, Raja R.: *See*—
Chyung, Kenneth; and Wusirika, Raja R., 4,222,760, Cl. 65-32.000.

Xerox Corporation: *See*—
Beatty, Charles L.; and Pollet, Jean-Claude, 4,222,982, Cl. 264-143.000.
Elter, John F., 4,223,203, Cl. 219-216.000.
Hagenbach, Robert J.; Forgensi, Rudolph; Volkers, Stewart W.; and Di Orazio, Dennis F., 4,223,085, Cl. 430-108.000.
Lloyd, William A.; Wong, Herman; and McFarland, Keith E., 4,222,497, Cl. 222-57.000.
Thornburg, David D., 4,223,088, Cl. 430-323.000.

Yamada, Hiromichi: *See*—
Inoue, Atsushi; Yamada, Hiromichi; and Suzuki, Kenji, 4,223,284, Cl. 333-150.000.

Yamada, Jun: *See*—
Hazama, Katashi; Yamada, Jun; and Noro, Yoshihiko, 4,223,285, Cl. 333-194.000.

Yamada, Katsuhito: *See*—
Katagiri, Haruo; Fujikake, Kenji; and Yamada, Katsuhito, 4,222,710, Cl. 416-236.00A.

Yamada, Koichi; Harato, Takuo; and Shiozaki, Yasumi, to Sumitomo Aluminium Smelting Company, Limited. Process for the removal of sulfur oxides from exhaust gases using slurry of red mud containing calcium ion. 4,222,992, Cl. 423-242.000.

Yamada, Tsuneo; and Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Trigger pulse forming circuit. 4,223,237, Cl. 307-268.000.

Yamada, Yasuharu: *See*—
Sano, Takezo; Kobayashi, Akio; and Yamada, Yasuharu, 4,223,117, Cl. 526-121.000.

Yamagiwa, Kazuo: *See*—
Tamaru, Hideshi; Isono, Katsuo; Sanada, Seiji; Yamagiwa, Kazuo; and Yamauchi, Toshiyuki, 4,223,338, Cl. 358-4.000.

Yamaguchi, Nobuo: *See*—
Kishino, Takao; Kawasaki, Kishio; and Yamaguchi, Nobuo, 4,223,244, Cl. 313-497.000.

Yamaki, Kiyoshi: *See*—
Nomura, Hiroyuki; Mogi, Takaaki; Kawasaki, Teruo; Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; and Matsuoka, Hideoki, 4,223,297, Cl. 340-62.000.

Yamamori, Kiyoshi; and Mizoguchi, Akira, to Matsushita Electric Industrial Co., Ltd. Liquid ejection system with air humidifying means operative during standby periods. 4,223,324, Cl. 346-140.00R.

Yamamoto, Heisuke: *See—*
Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, 4,222,355, Cl. 123-568.000.

Yamamura, Kyohei; Inoue, Takemi; Nemoto, Toshio; Miyao, Hidetoshi; Tsumura, Yukihiro; Toda, Hiromichi; and Sugiura, Itsuo, to Director-General of the Agency of Industrial Science and Technology; and Anritsudenki Kabushikigaisha. Radio wave power measuring apparatus. 4,223,264, Cl. 324-95.000.

Yamasaki, Tatsumi; Ota, Isamu; Hasegawa, Yutaka; Yamamoto, Heisuke; Kawai, Noriaki; and Abe, Toshihito, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Kabushiki Kaisha. Exhaust gas recirculation apparatus for an internal combustion engine. 4,222,355, Cl. 123-568.000.

Yamase, Takashi: *See—*
Zaitsu, Hiroshi; Yamase, Takashi; Yamashita, Sadao; and Mizushima, Kunio, 4,223,361, Cl. 360-133.000.

Yamashita, Sadao: *See—*
Zaitsu, Hiroshi; Yamase, Takashi; Yamashita, Sadao; and Mizushima, Kunio, 4,223,361, Cl. 360-133.000.

Yamato, Kazunari: *See—*
Sogo, Yasuo; Masumoto, Hiroki; Yamato, Kazunari; Miyoshi, Yasuhiko; Murata, Tomomi; and Sato, Eiji, 4,222,772, Cl. 75-124.000.

Yamauchi, Junichi: *See—*
Shibatani, Kyoichiro; Omura, Ikuo; and Yamauchi, Junichi, 4,222,780, Cl. 106-35.000.

Yamauchi, Toshiyuki: *See—*
Tamaru, Hideshi; Isono, Katsuo; Sanada, Seiji; Yamagiwa, Kazuo; and Yamauchi, Toshiyuki, 4,223,338, Cl. 358-4.000.

Yamazaki, Isao: *See—*
Sakashita, Tsutomu; and Yamazaki, Isao, 4,222,506, Cl. 222-600.000.

Yamazaki, Osamu: *See—*
Ono, Shusuke; Ohji, Kenzo; Yamazaki, Osamu; and Wasa, Kiyotaka, 4,223,286, Cl. 333-195.000.

Yamazaki, Takao: *See—*
Hijikata, Toshio; Yamazaki, Takao; and Fujita, Kiyohiko, 4,222,799, Cl. 148-143.000.

Yanessa, Silvio F., to Air Master Corporation. Sliding, pivoting window. 4,222,201, Cl. 49-189.000.

Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., to Conoco, Inc. Ethoxylation with strontium bases. 4,223,164, Cl. 568-618.000.

Yatabe, Akira: *See—*
Kmak, Walter S.; and Yatabe, Akira, 4,222,852, Cl. 208-48.00R.

Yeakey, Ernest L.: *See—*
Watts, Lewis W., Jr.; Brader, Walter H., Jr.; Moss, Philip H.; and Yeakey, Ernest L., 4,222,957, Cl. 260-512.00R.

Yeomans, Thomas E.: *See—*
Crim, Paul E.; Richmond, James W.; and Yeomans, Thomas E., 4,222,132, Cl. 5-81.00R.

Yevich, Joseph P.: *See—*
Covington, Robert R.; Temple, Davis L., Jr.; and Yevich, Joseph P., 4,223,031, Cl. 424-251.000.

Yo, Eiyu: *See—*
Yoshizaki, Shiro; Tamada, Shigeharu; Yo, Eiyu; and Nakagawa, Kazuyuki, 4,223,137, Cl. 544-128.000.

Yoda, Minoru; and Tokuoka, Yasumichi, to TDK Electronics Company Limited. Method of manufacturing ferromagnetic metal powder. 4,222,798, Cl. 148-105.000.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Power amplifying device for driving loudspeakers. 4,223,273, Cl. 330-85.000.

Yonezawa, Seiji; Tomura, Teruichi; Fukuhara, Akira; Kato, Keizo; and Umemoto, Masuo, to Hitachi, Ltd. Method and apparatus for recording and reproducing a video-disc with an oscillated track. 4,223,187, Cl. 179-100.10G.

Yoshida Kogyo K.K.: *See—*
Sawada, Mitsuo, 4,222,723, Cl. 425-116.000.

Yoshida, Kosaku; and Hara, Kunio, to Nifco Inc. Blind rivet. 4,222,304, Cl. 85-71.000.

Yoshida, Risaburo; Nagata, Hidetoshi; Naito, Michihisa; and Kaiho, Keisuke, to Toyo Ink Manufacturing Co., Ltd. Process for producing metal-boehemite laminates. 4,223,074, Cl. 428-469.000.

Yoshioka, Mitsuru: *See—*
Tsuji, Teruji; Yoshioka, Mitsuru; Kataoka, Takahiro; Sendo, Yuji; Hirai, Shoichi; Maeda, Takashi; and Nagata, Wataru, 4,223,132, Cl. 544-16.000.

Yoshizaki, Shiro; Tamada, Shigeharu; Yo, Eiyu; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives and process for preparing the same. 4,223,137, Cl. 544-128.000.

Young, Douglas L. G., to Ingersoll-Rand Canada Inc. Screening apparatus and method. 4,222,863, Cl. 209-273.000.

Ytterstrom, Gunnar E., to Aktiebolaget Stabil Mekaniska Verkstad. Apparatus for applying a band of material to the side of a circular body of revolution. 4,222,810, Cl. 156-405.00R.

Yu, Arthur J.: *See—*
Kim, Ki-Soo; Yu, Arthur J.; and Altscher, Siegfried, 4,223,104, Cl. 528-169.000.

Yuan, Wei W.: *See—*
Ballif, John L., III; and Yuan, Wei W., 4,223,064, Cl. 428-246.000.

Yukawa, Takahiro: *See—*
Hosono, Takashi; Ohkoshi, Akio; Tooyama, Takashi; Tooyama, Akira; and Yukawa, Takahiro, 4,223,344, Cl. 358-67.000.

Yukitoshi, Teruo: *See—*
Oda, Teishiro; Daikoku, Takashi; Yukitoshi, Teruo; and Nishida, Kazuhiko, 4,222,771, Cl. 75-124.000.

Zahora, Edward P.: *See—*
Zentner, Mark R.; Zahora, Edward P.; and Leo, Angelo F., 4,222,918, Cl. 260-29.2EP.

Zaitsu, Hiroshi; Yamase, Takashi; Yamashita, Sadao; and Mizushima, Kunio, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,223,361, Cl. 360-133.000.

Zalesak, Joseph F.; and Robinson, A. Zed, to United States of America, Navy. Low-frequency directional hydrophone. 4,223,400, Cl. 367-135.000.

Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., to Lord Corporation. Structural adhesive formulations. 4,223,115, Cl. 525-455.000.

Zaluska, Philip J.: *See—*
Bechara, Ibrahim S.; Mascioli, Rocco L.; and Zaluska, Philip J., 4,223,139, Cl. 544-171.000.

Zamorenov, Anatoly T.: *See—*
Tjurin, Nikolai A.; Lysov, Georgy V.; Koriev, Anatoly S.; Kuznetsova, Nina L.; and Zamorenov, Anatoly T., 4,222,176, Cl. 34-1.000.

Zang, Eugene E.; Sheck, Joe S.; and Calhoun, Clifford A., to United States of America, Interior. Precision drafting instrument. 4,222,693, Cl. 409-175.000.

Zani, Marina: *See—*
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,223,108, Cl. 525-212.000.

Zann, Annie: *See—*
Dubois, Jean-Claude; Nguyen, Tinh H.; and Zann, Annie, 4,222,888, Cl. 252-299.000.

Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for driving saw-tooth current in a coil. 4,223,367, Cl. 361-156.000.

Zeelen, Filippus J.; and Broess, Arnoldus I. A., to Akzona Incorporated. Cyclization substrates, cyclization process and related 11β-axially-substituted steroids. 4,222,940, Cl. 260-239.55R.

Zeiss Ikon AG Goerzwerk: *See—*
Tietz, Werner, 4,222,252, Cl. 70-364.00A.

Zellweger, Conrad; and Biondina, Joseph, to La Nationale S.A. Spectacle hinge. 4,222,148, Cl. 16-128.00A.

Zengel, Hans: *See—*
Hentschel, Peter; Zengel, Hans; and Bergfeld, Manfred, 4,223,145, Cl. 546-107.000.

Zentner, Mark R.; Zahora, Edward P.; and Leo, Angelo F., to DeSoto, Inc. Aqueous emulsions, methods of making the same and impregnated rovings made from the emulsions. 4,222,918, Cl. 260-29.2EP.

Zezulka, Gerd: *See—*
Pletka, Hans-Dieter; and Zezulka, Gerd, 4,222,930, Cl. 260-42.150.

Zhamkov, Nikolai V.: *See—*
Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A., 4,222,666, Cl. 356-243.000.

Zhizhilev, Savely A.: *See—*
Igonin, Vadim B.; Nikonov, Vladimir Z.; Sokolov, Lev B.; Savinov, Valentin M.; Vasiliev, Vitaly A.; Ivanov, Vladimir M.; Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Nikitina, Tatyana I.; Klimenko, Lidia A.; and Mischenko, Olga I., 4,223,105, Cl. 528-179.000.

Zimmermann, Anton; and Haenni, Roland, to Ciba-Geigy AG. Coating apparatus. 4,222,343, Cl. 118-325.000.

Zimmern, Bernard, to Uniscrew Limited. Method for machining the screw of a compression or expansion machine and a device for the application of said method. 4,222,691, Cl. 409-26.000.

Zoecon Corporation: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,223,012, Cl. 424-84.000.
Henrick, Clive A., 4,223,033, Cl. 424-263.000.

Zuckler, Karl, to Siemens Aktiengesellschaft. Gas blast circuit breaker. 4,223,192, Cl. 200-148.00R.

Zuendt, Richard F.: *See—*
Bengali, Ajay M.; Zuendt, Richard F.; Allan, John L. H.; and Readio, Philip D., 4,222,779, Cl. 106-14.120.

Zuurdeeg, Eduard, to Akzo N.V. Process for electro-codepositing inorganic particles and a metal on a surface. 4,222,828, Cl. 204-16.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bitonti, Paul A., to Ross Operating Valve Company. Safety valve for fluid systems. Re. 30,403, Cl. 91-29.000.

Cotton Machinery Company, Inc.: *See*—
Pereira, Ernest G.; and Fitch, Guy W., deceased, Re. 30,404, Cl. 414-439.000.

Fischer, William K., to Uniroyal, Inc. Thermoplastic blend of partially cured monoolefin copolymer rubber and polyolefin plastic. Re. 30,405, Cl. 525-240.000.

Fitch, Guy W., deceased: *See*—
Pereira, Ernest G.; and Fitch, Guy W., deceased, Re. 30,404, Cl. 414-439.000.

Fitch, Lisa A., administrator: *See*—
Pereira, Ernest G.; and Fitch, Guy W., deceased, Re. 30,404, Cl. 414-439.000.

Johanson, John E., to Johanson Manufacturing Corporation. Adjustable low-loss capacitor. Re. 30,406, Cl. 361-296.000.

Johanson Manufacturing Corporation: *See*—
Johanson, John E., Re. 30,406, Cl. 361-296.000.

Pereira, Ernest G.; and Fitch, Guy W., deceased (by Fitch, Lisa A., administrator), to Cotton Machinery Company, Inc. Conveyor-trailer for transporting an agricultural commodity. Re. 30,404, Cl. 414-439.000.

Ross Operating Valve Company: *See*—
Bitonti, Paul A., Re. 30,403, Cl. 91-29.000.

Uniroyal, Inc.: *See*—
Fischer, William K., Re. 30,405, Cl. 525-240.000.

LIST OF DESIGN PATENTEES

AB Bahco Verktyg: *See*—
Jansson, Erik C., 256,882, Cl. D8-83.000.

AB Volvo: *See*—
Persson, Bengt G., 256,904, Cl. D12-53.000.

Allen, Derek R. Dual stethoscope microphone. 256,951, 9-16-80, Cl. D24-20.000.

Allen, John C., 3rd, to S. B. Ramagosa & Sons. Water slide or similar article. 256,940, 9-16-80, Cl. D21-244.000.

American Cyanamid Company: *See*—
DiScala, Eugene P., 256,885, Cl. D9-167.000.
DiScala, Eugene P., 256,886, Cl. D9-168.000.
Grodin, Adam J., 256,884, Cl. D9-60.000.

Angelinetta, Denis. Filter. 256,943, 9-16-80, Cl. D23-4.000.

Ansa, Ltd.: *See*—
Bedrosian, Sarkis, 256,858, Cl. D6-85.000.

Arima, Takeo; Kaminaka, Yoshinori; and Kikuchi, Kazumi, to Hochiki Corporation. Smoke detector. 256,897, 9-16-80, Cl. D10-106.000.

Arnone, Joseph A. Table for retouching photographs. 256,869, 9-16-80, Cl. D6-178.000.

Astro Optics Corporation: *See*—
Barr, Leslie, 256,898, Cl. D10-113.000.

Audiovox Corporation: *See*—
Needleman, Ronald, 256,915, Cl. D14-37.000.

Ballay, Hubert. Decal or the like. 256,928, 9-16-80, Cl. D20-11.000.

Barr, Leslie, to Astro Optics Corporation. Raised curb marker or similar article. 256,898, 9-16-80, Cl. D10-113.000.

Baus, Andre E. J.; and Menster, Armand M., to Goodyear Tire & Rubber Company, The. Tire. 256,907, 9-16-80, Cl. D12-147.000.

Bedrosian, Sarkis, to Ansa, Ltd. Jewelry display stand. 256,858, 9-16-80, Cl. D6-85.000.

Bergh, Magnhild L., to Strouse, Adler Company, The. Body briefer. 256,849, 9-16-80, Cl. D2-3.000.

Berkley & Company, Inc.: *See*—
McMickle, Robert L., 256,942, Cl. D22-23.000.

Boersma, Donald J., to Iodon Incorporated. Drain cover. 256,948, 9-16-80, Cl. D23-42.000.

Boukma, John, to Howard Miller Clock Company. Floor clock. 256,892, 9-16-80, Cl. D10-16.000.

Boyer, David C.; and Pliml, Frank V., Jr., to Illinois Tool Works Inc. Electric light socket. 256,911, 9-16-80, Cl. D13-25.000.

Bradner, John G.: *See*—
Swade, Kenneth M.; and Bradner, John G., 256,887, Cl. D9-267.000.
Swade, Kenneth M.; and Bradner, John G., 256,888, Cl. D9-267.000.
Swade, Kenneth M.; and Bradner, John G., 256,889, Cl. D9-267.000.

Braun Aktiengesellschaft: *See*—
Rams, Dieter, 256,914, Cl. D14-33.000.

Britzman, Agnita. Pillow cover. 256,870, 9-16-80, Cl. D6-269.000.

Brock, George F., Jr. Garden rake. 256,880, 9-16-80, Cl. D8-13.000.

Bruce, Angus J. Elephant bunk bed. 256,854, 9-16-80, Cl. D6-5.000.

Bruno, Robert H., to Stanley Works, The. Tape rule. 256,894, 9-16-80, Cl. D10-72.000.

Brunswick Corporation: *See*—
Fox, William L., Jr., 256,944, Cl. D23-4.000.

California R & D Center: *See*—
Jones, Lawrence T.; and Lee, Robert S., 256,932, Cl. D21-166.000.
Jones, Lawrence T.; and Lee, Robert S., 256,933, Cl. D21-166.000.
Jones, Lawrence T.; and Lee, Robert S., 256,934, Cl. D21-166.000.

California Screw Corporation: *See*—
Terrazas, Ralph, 256,947, Cl. D23-19.000.

Campbell, Paul R.; and Pardo, John, to Procter & Gamble Company, The. Spray pump. 256,946, 9-16-80, Cl. D23-17.000.

Caranica, Gloria; and Marconi, Karen D., to Quaker Oats Company, The. Toy house. 256,929, 9-16-80, Cl. D21-114.000.

Carpenter, Jack H. Display rack. 256,855, 9-16-80, Cl. D6-24.000.

Carr, Harold F., Jr.; and Humphries, David F., to Dover Corporation. Wrecker body. 256,901, 9-16-80, Cl. D12-14.000.

Castelli, Bertrand. Ball paddle for table game. 256,938, 9-16-80, Cl. D21-213.000.

Castelli, Bertrand. Ball paddle for table game. 256,939, 9-16-80, Cl. D21-213.000.

Clark Equipment Company: *See*—
Kuhn, Patrick, 256,921, Cl. D15-23.000.

Conroy, John M. Aircraft. 256,906, 9-16-80, Cl. D12-80.000.

Crowe, Douglas M., to Smith & Stone Limited. Towel rack bracket. 256,865, 9-16-80, Cl. D6-103.000.

Crowe, Stephen H., Jr.: *See*—
Leibin, Ronald A.; and Crowe, Stephen H., Jr., 256,909, Cl. D12-157.000.

De Filippis, John; and Shackelton, Clifford W., to International Telephone and Telegraph Corporation. Combination telephone instrument. 256,917, 9-16-80, Cl. D14-53.000.

Design Programmes S.A.: *See*—
Tallon, Roger, 256,857, Cl. D6-56.000.

DiScala, Eugene P., to American Cyanamid Company. Bottle. 256,885, 9-16-80, Cl. D9-167.000.

DiScala, Eugene P., to American Cyanamid Company. Bottle. 256,886, 9-16-80, Cl. D9-168.000.

Diskin, Stephen P. Clock. 256,890, 9-16-80, Cl. D10-15.000.

Diskin, Stephen P. Clock. 256,891, 9-16-80, Cl. D10-15.000.

Domanski, Jeanette V. Patio door guard gate. 256,952, 9-16-80, Cl. D25-50.000.

Donahue, Richard K. Safety restraint vest or the like. 256,850, 9-16-80, Cl. D2-27.000.

Dover Corporation: *See*—
Carr, Harold F., Jr.; and Humphries, David F., 256,901, Cl. D12-14.000.

Dowler & Wakefield Limited: *See*—
Wharmby, Martin, 256,883, Cl. D8-98.000.

Draisey, Brian: *See*—
Ettridge, Ian G.; and Draisey, Brian, 256,873, Cl. D7-62.000.

Dunlop Limited: *See*—
Popplewell, Frank W., 256,936, Cl. D21-207.000.
Popplewell, Frank W., 256,937, Cl. D21-207.000.

Emerson Electric Co.: *See*—
Patel, Yogesh G., 256,949, Cl. D23-127.000.

Emmegizeta Metalmeccanica Gori & Zucchi M.G.Z. S.p.A.: *See*—
Mazzini, Giovanni, 256,899, Cl. D11-13.000.

Ettridge, Ian G.; and Draisey, Brian, to Goblin (B.V.C.) Limited Goblin Works. Teamaker. 256,873, 9-16-80, Cl. D7-62.000.

Fairchild Industries, Inc.: *See*—
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160	4,222,264
170 R	4,222,265
179	4,222,266
304 C	4,222,267
371	4,222,268
425.4 R	4,222,269
504	4,222,270
515	4,222,271
517 R	4,222,272
603	4,222,273
607	4,222,274
636	4,222,275
714	4,222,276
721	4,222,277

CLASS 74

5.5	4,222,278
100 R	4,222,279
339	4,222,281
457	4,222,282
467	4,222,283
473 R	4,222,284
480 R	4,222,285
501 R	4,222,286
529	4,222,287
665 B	4,222,288
740	4,222,289
801	4,222,290
813 R	4,222,291
866	4,222,292

CLASS 75

12	4,222,768
120	4,222,769
122	4,222,770
124	4,222,771
	4,222,772
125	4,222,773
148	4,222,774
170	4,222,775

CLASS 81

90 B	4,222,293
177 R	4,222,294

CLASS 83

169	4,222,295
459	4,222,296
481	4,222,297
853	4,222,298
870	4,222,299
886	4,222,300

CLASS 84

1.15	4,222,301
283	4,222,302
315	4,222,303

CLASS 85

41	4,222,689
71	4,222,304

CLASS 86

37	4,222,305

CLASS 89

1 L	4,222,306
37 C	4,222,307
163	4,222,308

CLASS 91

29	Re.30,403
471	4,222,309

CLASS 92

128	4,222,310

CLASS 93

36 M	4,222,311
40	4,222,312
93 C	4,222,313

CLASS 98

2.1	4,222,314
37	4,222,315
40 DL	4,222,316
56	4,222,317
94 R	4,222,318
115 SB	4,222,319

CLASS 99

281	4,222,320
458	4,222,321
467	4,222,322

CLASS 100

12	4,222,323
47	4,222,324

CLASS 101

137	4,222,325
183	4,222,326
288	4,222,327
350	4,222,328

CLASS 102

24 HC	4,222,329
38 R	4,222,330

CLASS 105

199 C	4,222,331
215 C	4,222,332
250	4,222,333
	4,222,334
397	4,222,335
418	4,222,336

CLASS 106

1.11	4,222,778
14.12	4,222,779
35	4,222,780
47 Q	4,222,781
57	4,222,782
73.32	4,222,783
93	4,222,784
97	4,222,785
117	4,222,786
281 R	4,222,787
289	4,222,788
300	4,222,789
304	4,222,790

CLASS 110

336	4,222,337
	4,222,338

CLASS 112

158 E	4,222,339

CLASS 114

245	4,222,340
264	4,222,341

CLASS 118

50	4,222,342
325	4,222,343
608	4,222,344
720	4,222,345

CLASS 119

14.18	4,222,346
16	4,222,347
17	4,222,348

CLASS 122

20 B	4,222,349
32	4,222,350

CLASS 123

3	4,222,351
41.12	4,222,353
90.16	4,222,354
195 C	4,222,360
366	4,222,359
484	4,222,352
495	4,222,358
568	4,222,355
	4,222,356
	4,222,357

CLASS 124

5	4,222,361

CLASS 125

11 CD	4,222,362

CLASS 126

77	4,222,363
111	4,222,364
400	4,222,365
415	4,222,366
419	4,222,367
438	4,222,368
	4,222,369
439	4,222,370
440	4,222,371
443	4,222,372
448	4,222,373

CLASS 128

1 R	4,222,374
	4,222,377
23	4,222,375
25 R	4,222,376
206.24	4,222,378
214 D	4,222,379
216	4,222,380
270	4,222,381
303 R	4,222,382
335	4,222,383
349 B	4,222,384
419 PG	4,222,385
	4,222,386
460	4,222,387
479	4,222,388
633	4,222,389
677	4,222,390
736	4,222,391
743	4,222,392
746	4,222,393
773	4,222,394

CLASS 130

27 T	4,222,395

CLASS 131

105	4,222,396
138 R	4,222,397

CLASS 132

34 R	4,222,398
73	4,222,399

CLASS 135

1 A	4,222,400
1 R	4,222,401

CLASS 136

246	4,223,174

CLASS 137

87	4,222,402
183	4,222,403
205	4,222,404
216.1	4,222,405
246.22	4,222,406
512.15	4,222,407
518	4,222,408
596.13	4,222,409
606	4,222,410
614.04	4,222,411
625.47	4,222,412
637.3	4,222,413

CLASS 138

30	4,222,414

CLASS 139

83	4,222,415

CLASS 141

27	4,222,416
392	4,222,417

CLASS 144

2 Z	4,222,418
193 R	4,222,419
246 A	4,222,420
325	4,222,421

CLASS 148

1.5	4,222,791
	4,222,792
2	4,222,793
3	4,222,794
9.6	4,222,795
12 F	4,222,796
12.7 A	4,222,797
105	4,222,798
143	4,222,799

CLASS 149

109.6	4,222,800

CLASS 150

1	4,222,422

CLASS 152

209 B	4,222,424
209 R	4,222,423
234	4,222,425

CLASS 156

49	4,222,801
53	4,222,802
85	4,222,803
182	4,222,804
184	4,222,805
213	4,222,806
244.13	4,222,807
245	4,222,808
267	4,222,809
272	4,222,974
405 R	4,222,810
406	4,222,811
497	4,222,812
540	4,222,813
612	4,222,814
630	4,222,815
643	4,222,816

CLASS 157

1.28	4,222,426

CLASS 160

19	4,222,427
231 R	4,222,428

CLASS 162

4	4,222,817
66	4,222,818
76	4,222,819
158	4,222,820

164 R 4,222,821

CLASS 164

34 4,222,429
61 4,222,430
89 4,222,431
446 4,222,432
448 4,222,433

CLASS 165

10 4,222,434
11 R 4,222,435
105 4,222,436

CLASS 166

245 4,222,437
250 4,222,438
272 4,222,439
314 4,222,440

CLASS 172

59 4,222,441
273 4,222,442

CLASS 173

116 4,222,443

CLASS 174

15 R 4,223,175
42 4,223,176
52 S 4,223,177
65 R 4,223,178
73 R 4,223,179

CLASS 175

72 4,222,444
106 4,222,445
329 4,222,446
340 4,222,447

CLASS 176

20 R 4,222,822

CLASS 177

1 4,222,448
132 4,222,551

CLASS 179

1 D 4,223,181
1 SC 4,223,180
1.5 R 4,223,182
2 DP 4,223,183
16 EA 4,223,184
84 VF 4,223,185
90 K 4,223,186
100.1 G 4,223,187
100.3 A 4,223,188
182 R 4,223,189

CLASS 180

8 A 4,222,449
65 D 4,222,450
89.18 4,222,451
162 4,222,452
193 4,222,453

CLASS 181

117 4,222,454
121 4,222,455
296 4,222,456

CLASS 182

2 4,222,457
81 4,222,458
152 4,222,459
211 4,222,460

CLASS 187

20 4,222,461

CLASS 188

67 4,222,462
72.3 4,222,463
73.3 4,222,464
73.5 4,222,465
76 4,222,466
79.5 GE 4,222,467

CLASS 190

42 4,222,468

CLASS 192

0.096 4,222,474
4 A 4,222,469
17 A 4,222,470
18 B 4,222,471
36 4,222,472
43.1 4,222,473
106.2 4,222,475
4,222,476

CLASS 198

347 4,222,477
358 4,222,478
482 4,222,479
490 4,222,480
684 4,222,481
721 4,222,482
831 4,222,483

CLASS 200

84 R 4,223,190
145 4,223,191
148 R 4,223,192
308 4,223,193

CLASS 201

2.5 4,222,823
41 4,222,824

CLASS 203

11 4,222,825

CLASS 204

1.5 4,222,826
14 N 4,222,827
16 4,222,828
55 R 4,222,829
67 4,222,830
98 4,222,831
106 4,222,832
128 4,222,833
129.6 4,222,834
159.16 4,222,835
180 G 4,222,836
181 C 4,222,837
192 E 4,222,838
4,222,839
195 S 4,222,840
247 4,222,841
290 F 4,222,842
299 R 4,222,843

CLASS 206

3 4,222,484
141 4,222,485
379 4,222,486
444 4,222,487

CLASS 208

8 LE 4,222,844
4,222,845
4,222,846
4,222,847
4,222,848
4,222,849
11 R 4,222,850
45 4,222,851
48 AA 4,222,853
48 R 4,222,852
80 4,222,854
111 4,222,855
120 4,222,856

CLASS 209

9 4,222,857
11 4,222,858
143 4,222,859
159 4,222,860
166 4,222,861
4,222,862
273 4,222,863
284 4,222,864
399 4,222,865
417 4,222,866
427 4,222,867
583 4,222,488

CLASS 210

235 4,222,875
293 4,222,876
411 4,222,877
413 4,222,878
520 4,222,879
636 4,222,871
639 4,222,870
646 4,222,869
650 4,222,874
748 4,222,868
777 4,222,873

CLASS 211

45 4,222,489
60 SK 4,222,490

CLASS 212

153 4,222,491
270 4,222,492

CLASS 219

10.55 B 4,223,195
10.55 F 4,223,194
61.2 4,223,196
61.7 4,223,197
69 W 4,223,198
121 EB 4,223,200
121 EM 4,223,199
121 L 4,223,202
121 LC 4,223,201
216 4,223,203
243 4,223,204
365 4,223,205
374 4,223,206
494 4,223,207
530 4,223,208
549 4,223,209

CLASS 220

8 4,222,493
66 4,222,494

CLASS 221

68 4,222,495

CLASS 222

16 4,222,496
57 4,222,497
58 4,222,498
183 4,222,499
207 4,222,500
4,222,501
240 4,222,502
508 4,222,503
569 4,222,504
600 4,222,505
4,222,506

CLASS 223

37 4,222,507

CLASS 224

324 4,222,508

CLASS 225

77 4,222,509
94 4,222,510
100 4,222,511

CLASS 226

181 4,222,512

CLASS 233

26 4,222,513

CLASS 235

92 AC 4,223,210
92 DN 4,223,211
92 MP 4,223,212
92 T 4,223,213
375 4,222,518
492 4,222,516
493 4,222,517

CLASS 239

14 4,222,519
70 4,222,520
135 4,222,521
160 4,222,522
216 4,222,523
315 4,222,524
343 4,222,525
556 4,222,526

CLASS 241

33 4,222,527
46.02 4,222,528
77 4,222,529
194 4,222,530
281 4,222,531

CLASS 242

55.2 4,222,532
58.3 4,222,533
84.2 R 4,222,534
128 4,222,535
191 4,222,536
212 4,222,537

CLASS 248

56 4,222,538
74 B 4,222,539
205 R 4,222,540
210 4,222,541
243 4,222,542
394 4,222,543
495 4,222,544
524 4,222,545
676 4,222,546

CLASS 249

120 4,222,547

CLASS 250

203 R 4,223,214
211 R 4,223,215
226 4,223,216
227 4,223,217
262 4,223,218
272 4,223,219
310 4,223,220
363 S 4,223,221
4,223,222
397 4,223,223
442 4,223,224
445 T 4,223,225
458 4,223,226
491 4,223,227
4,223,228
515 4,223,229
523 4,223,230
577 4,223,231

CLASS 252

8.55 D 4,222,881
51.5 A 4,222,882
52 R 4,222,883
4,222,884
63.2 4,222,885
149 4,222,886
299 4,222,887
4,222,888
301.1 R 4,222,889
301.4 P 4,222,890
316 4,222,891
428 4,222,892
429 B 4,222,893
4,222,894
4,222,895
437 4,222,896
439 4,222,897
447 4,222,898
469 4,222,899
474 4,222,900
500 4,222,901
4,222,902
518 4,222,903
522 R 4,222,904
547 4,222,905

CLASS 254

8 B 4,222,548
93 HP 4,222,549
223 4,222,550

CLASS 256

13.1 4,222,552

CLASS 260

5 4,222,906
6 4,222,907
16 4,222,908
18 TN 4,222,909
4,222,910
22 TN 4,222,911
23 AR 4,222,913
23 EP 4,222,912
23.7 B 4,222,914
23.7 H 4,222,915
29.1 SB 4,222,917
29.2 EP 4,222,918
29.4 R 4,222,919
29.6 BE 4,222,922
29.6 H 4,222,921
29.6 M 4,222,920
31.8 DR 4,222,923
33.6 UA 4,222,924
37 N 4,222,925
40 R 4,222,926
4,222,927
4,222,928
40 TN 4,222,929
42.15 4,222,930
45.8 NZ 4,222,931
45.9 KB 4,222,932
107 4,222,933
122 4,222,934
205 4,222,935
239 A 4,222,938
239.1 4,222,939
239.55 R 4,222,940
285 AS 4,222,916
326.62 4,222,936
333 4,222,937
345.1 4,222,941
345.8 R 4,222,942
4,222,943
346.71 4,222,944
346.75 4,222,945
347.3 4,222,946
380 4,222,947
397.25 4,222,949
397.7 R 4,222,948
429.7 4,222,950
463 4,222,954
465 E 4,222,955
465.4 4,222,956
466 4,222,953
512 R 4,222,957
559 D 4,222,958
559 R 4,222,960
562 R 4,222,959
563 D 4,222,961
571 4,222,962
653 4,222,968
653.8 4,222,967
665 R 4,222,969
968 4,222,970

CLASS 261

92 4,222,971
121 R 4,222,972

CLASS 264

22 4,222,973
35 4,222,975
36 4,222,976
63 4,222,977
65 4,222,978
75 4,222,979
85 4,222,980
117 4,222,981
143 4,222,982
220 4,222,983
261 4,222,984

CLASS 266

47 4,222,553
120 4,222,554

CLASS 267

131 4,222,555

CLASS 271

3.1 4,222,556
4 4,222,557

CLASS 272

31 A 4,222,558
63 4,222,559
68 4,222,560

CLASS 273

1 R 4,222,561
67 R 4,222,562
4,222,563
153 R 4,222,565
164 4,222,566
167 R 4,222,567
176 H 4,222,568
183 B 4,222,569
237 4,222,570
4,222,571
306 4,222,572
369 4,222,564
426 4,222,573

CLASS 274

13 R 4,222,574

CLASS 277

59 4,222,575
237 R 4,222,576

CLASS 279

114 4,222,577

CLASS 280

6.11 4,222,578
33.99 H 4,222,579
47.34 4,222,580
81 R 4,222,581
87.02 R 4,222,582
461 A 4,222,583
626 4,222,584
654 4,222,585
803 4,222,586
804 4,222,587
4,222,588

CLASS 285

9 R 4,222,589
14 4,222,590
18 4,222,591
4,222,592
85 4,222,593
280 4,222,594

CLASS 292

91 4,222,595
342 4,222,596

CLASS 294

1 B 4,222,598
1 BA 4,222,597
12 4,222,599

CLASS 296

37.1 4,222,600
37.16 4,222,601
137 G 4,222,602
146 4,222,603
165 4,222,604
166 4,222,605
183 4,222,606

CLASS 297

284 4,222,607
410 4,222,608
468 4,222,609
483 4,222,610

CLASS 299

4 4,222,611
11 4,222,612

CLASS 303

6 C 4,222,613
20 4,222,614
92 4,222,615

CLASS 305

54 4,222,616

CLASS 307

66 4,223,232
221 D 4,223,233
4,223,234
241 4,223,235
252 Q 4,223,236
268 4,223,237
297 4,223,238

CLASS 308

9 4,222,617
4,222,618
176 4,222,619
217 4,222,620

CLASS 310

52 4,223,239
74 4,223,240
308 4,223,241
316 4,223,242

CLASS 312

37 4,222,621

CLASS 313

268 4,223,243
497 4,223,244

CLASS 315

39.51 4,223,245
39.71 4,223,246
57 4,223,247
185 S 4,223,248
209 M 4,223,249
248 4,223,250
370 4,223,251
375 4,223,252
382 4,223,253

CLASS 318

2 4,223,254
138 4,223,255
282 4,223,256
594 4,223,257
599 4,223,258
648 4,223,259
696 4,223,260
721 4,223,261

CLASS 320

40 4,223,262

CLASS 322

47 4,223,263

CLASS 324

95 4,223,264
127 4,223,265
154 R 4,223,266

CLASS 328

48 4,223,268
63 4,223,269
112 4,223,270
127 4,223,271

CLASS 330

51 4,223,272
85 4,223,273
133 4,223,274
257 4,223,275
4,223,276
264 4,223,277

CLASS 331

94.5 PE 4,223,278
4,223,279
111 4,223,280
4,223,281

CLASS 332

10 4,223,282

CLASS 333

109 4,223,283
150 4,223,284
194 4,223,285
195 4,223,286
206 4,223,287

CLASS 335

20 4,223,288
202 4,223,289
229 4,223,290

CLASS 337

303 4,223,291

CLASS 338

32 H 4,223,292
34 4,223,293
122 4,223,294

CLASS 339

17 CF 4,222,622
34 4,222,623
91 R 4,222,624
143 C 4,222,625
147 R 4,222,626
4,222,627

CLASS 340

32 4,223,295
52 D 4,223,296
62 4,223,297
64 4,223,298

166 R 4,223,299
196 4,223,300
500 4,223,301
525 4,223,302
531 4,223,303
566 4,223,304
629 4,223,305
650 4,223,306
656 4,223,307
719 4,223,308
870.07 4,223,313

CLASS 343

5 W 4,223,309
100 CS 4,223,310
112 D 4,223,311
117 R 4,223,312
715 4,223,314
742 4,223,315
781 P 4,223,316
803 4,223,317

CLASS 346

1.1 4,223,318
7 4,223,319
75 4,223,320
4,223,321
140 R 4,223,322
4,223,323
4,223,324
145 4,223,325

CLASS 350

96.11 4,222,628
96.14 4,222,638
96.20 4,222,629
96.24 4,222,630
96.31 4,222,631
102 4,222,632
162 R 4,222,633
189 4,222,634
320 4,222,635
350 R 4,222,636
356 4,222,637

CLASS 351

4 4,222,639
83 4,222,640

CLASS 353

84 4,222,641

CLASS 354

1 4,222,642
7 4,222,643
23 D 4,222,644
51 4,222,645
79 4,222,646
145 4,222,647
171 4,222,648
173 4,222,649
4,222,650
214 4,222,651
234 4,222,652
270 4,222,653
293 4,222,654
308 4,222,655
317 4,222,656
324 4,222,657
354 4,222,658

CLASS 355

14 R 4,222,659
4,222,660
38 4,222,661
40 4,222,662

CLASS 356

45 4,222,663
73.1 4,222,664
218 4,222,665
243 4,222,666
346 4,222,667
350 4,222,668
360 4,222,669
414 4,222,670

CLASS 357

15 4,223,327
22 4,223,328
24 4,223,329
32 4,223,330
38 4,223,331
4,223,332
41 4,223,333
42 4,223,334
48 4,223,335
63 4,223,336
68 4,223,337

CLASS 358

4 4,223,338
31 4,223,339
4,223,340
36 4,223,341
37 4,223,342
54 4,223,343
67 4,223,344
93 4,223,345
106 4,223,346
128.5 4,223,347
4,223,348
4,223,349
139 4,223,350
182 4,223,351
185 4,223,352
230 4,223,353
233 4,223,354
248 4,223,355
261 4,223,356
264 4,223,357

CLASS 360

75 4,223,358
99 4,223,359
123 4,223,360
133 4,223,361
137 4,223,362

CLASS 361

18 4,223,363
37 4,223,364
71 4,223,365
127 4,223,366
156 4,223,367
220 4,223,368
296 Re.30,406
321 4,223,369
331 4,223,370
391 4,223,371

CLASS 362

8 4,223,372
13 4,223,373
31 4,223,374
72 4,223,375
112 4,223,376
145 4,223,377

CLASS 363

26 4,223,378

CLASS 364

104 4,223,379
200 4,223,380
4,223,381
4,223,382
411 4,223,383
414 4,223,384
472 4,223,385
506 4,223,386
515 4,223,387
521 4,223,388
724 4,223,389
900 4,223,390
4,223,391
4,223,392
4,223,393

CLASS 365

194 4,223,396
210 4,223,394
229 4,223,395

CLASS 366

337 4,222,671
338 4,222,672

CLASS 367

13 4,223,397
34 4,223,398
41 4,223,399
135 4,223,400
168 4,223,401

CLASS 368

27 4,222,227
113 4,222,226
118 4,223,267
238 4,223,402
291 4,222,228

CLASS 371

27 4,222,514
49 4,223,326
68 4,222,515

CLASS 375

2 4,223,403
94 4,223,404

CLASS 400

56 4,222,673
124 4,222,674
474 4,222,675

CLASS 401

28 4,222,676
129 4,222,677
218 4,222,678

CLASS 402

75 4,222,679

CLASS 403

56 4,222,680

CLASS 405

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203 4,222,682
204 4,222,683
232 4,222,684
270 4,222,685
295 4,222,686

CLASS 408

79 4,222,687
115 B 4,222,688
230 4,222,690

CLASS 409

26 4,222,691
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CLASS 410

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131 4,222,986
150 4,222,987
309 4,222,988

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158 4,222,990
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243 4,222,993
321 S 4,222,994
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631 4,223,000
655 4,223,001

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566 4,222,733

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538 4,223,046

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272 4,223,065
306 4,223,066
308 4,223,067
310 4,223,068
324 4,223,069
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412 4,223,072
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610 4,223,075

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4,223,080
234 4,223,081

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108 4,223,085
119 4,223,086
302 4,223,087
323 4,223,088
363 4,222,777

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CLASS 432

80 4,222,735
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253 4,222,737

CLASS 433

105 4,222,738

CLASS 435

12 4,223,089
19 4,223,090
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4,223,092
295 4,223,093
312 4,223,094

CLASS 455

105 4,223,405
180 4,223,406
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CLASS 474

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CLASS 521

55 4,223,095
116 4,223,098

CLASS 525

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269 4,223,151
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20 4,223,156
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583 4,223,162

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345 4,223,168
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726 4,223,171
771 4,223,165
779 4,223,166
812 4,223,172
820 4,223,167
835 4,223,173

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D1—	24	256,848		122	256,867		168	256,886		78	256,905	D18—	2	256,924	D22—	23	256,942
D2—	3	256,849		154	256,868		267	256,887		80	256,906	D19—	47	256,925	D23—	4	256,943
	27	256,850		178	256,869			256,888		147	256,907		57	256,926			256,944
	232	256,851		269	256,870			256,889		156	256,908		59	256,927		14	256,945
D3—	56	256,852	D7—	2	256,871	D10—	15	256,890		157	256,909	D20—	11	256,928		17	256,946
	71	256,853		38	256,872			256,891		209	256,910	D21—	114	256,929		19	256,947
D6—	5	256,854		62	256,873		16	256,892	D13—	25	256,911			256,930		42	256,948
	24	256,855		92	256,874		57	256,893	D14—	11	256,912		141	256,931		127	256,949
	25	256,856		99	256,875		72	256,894		17	256,913		166	256,932	D24—	10	256,950
	56	256,857			256,876		78	256,895		33	256,914			256,933		20	256,951
	85	256,858		152	256,877			256,896		37	256,915			256,934	D25—	50	256,952
	90	256,861		175	256,878		106	256,897		45	256,916		195	256,935		80	256,953
	95	256,859			256,879		113	256,898		53	256,917		207	256,936			256,954
	97	256,860	D8—	13	256,880	D11—	13	256,899		58	256,918			256,937	D28—	64	256,955
	99	256,862		62	256,881		157	256,900			256,919		213	256,938	D30—	1	256,957
		256,863		83	256,882	D12—	14	256,901		80	256,920			256,939		2	256,956
		256,864		98	256,883		31	256,902	D15—	23	256,921		244	256,940		99	256,958
	103	256,865	D9—	60	256,884		51	256,903		70	256,922		250	256,941	D99—		256,959
	106	256,866		167	256,885		53	256,904		80	256,923						

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1 :	4,222,271		4,222,179		4,223,209		4,222,389		4,222,812	22 :	4,222,140
	4,222,418		4,222,180		4,223,214		4,222,434		4,222,861		4,222,790
4 :	4,222,165		4,222,181		4,223,216		4,222,501		4,222,862		4,222,866
	4,222,347		4,222,188		4,223,226		4,222,517		4,222,893		4,223,140
	4,222,398		4,222,197		4,223,241		4,222,518		4,222,912	23 :	4,222,806
	4,222,597		4,222,198		4,223,255		4,222,529		4,222,918	24 :	4,222,126
6 :	Re.30,404		4,222,238		4,223,257		4,222,564		4,222,971		4,222,131
	4,222,207		4,222,240		4,223,258		4,222,567		4,222,980		4,222,173
	4,222,251		4,222,241		4,223,270		4,222,569		4,223,005		4,222,242
	4,222,296		4,222,345		4,223,279		4,222,571		4,223,024		4,222,244
	4,222,301		4,222,371		4,223,319		4,222,667		4,223,056		4,222,361
	4,222,302		4,222,392		4,223,349		4,222,701		4,223,129		4,222,375
	4,222,315		4,222,406		4,223,390		4,222,858		4,223,136		4,222,436
	4,222,329		4,222,449		4,223,399		4,222,879		4,223,158		4,222,484
	4,222,365		4,222,462		4,223,404		4,223,040		4,223,174		4,222,688
	4,222,412		4,222,497	08 :	4,222,170		4,223,190		4,223,178		4,222,699
	4,222,414		4,222,503		4,222,458		4,223,277		4,223,179		4,222,759
	4,222,548		4,222,511		4,222,479		4,223,307		4,223,196		4,222,785
	4,222,606		4,222,528		4,222,577		4,223,334		4,223,215		4,222,934
	4,222,807		4,222,539		4,222,845		4,223,400		4,223,310		4,223,311
	4,222,814		4,222,541		4,222,846	13 :	4,222,546		4,223,363		4,223,374
	4,222,854		4,222,573		4,222,850		4,223,212	18 :	4,222,172	25 :	4,222,160
	4,222,968		4,222,574		4,223,094	16 :	4,222,182		4,222,175		4,222,191
	4,223,012		4,222,581		4,223,189		4,222,274		4,222,183		4,222,227
	4,223,028		4,222,590		4,223,205		4,223,007		4,222,192		4,222,272
	4,223,029		4,222,591	09 :	4,222,513		4,223,018		4,222,218		4,222,325
	4,223,071		4,222,617		4,222,675	17 :	4,222,141		4,222,231		4,222,348
	4,223,088		4,222,648		4,222,716		4,222,143		4,222,282		4,222,350
	4,223,291		4,222,650		4,222,794		4,222,200		4,222,318		4,222,374
	4,223,317		4,222,668		4,222,808		4,222,216		4,222,336		4,222,378
	4,223,394		4,222,671		4,223,057		4,222,256		4,222,467		4,222,557
8 :	4,222,388		4,222,673		4,223,111		4,222,287		4,222,488		4,222,704
	4,222,520		4,222,677		4,223,120		4,222,332		4,222,535		4,222,737
9 :	4,222,275		4,222,685		4,223,202		4,222,333		4,223,031		4,222,782
	4,222,391		4,222,744		4,223,221		4,222,334		4,223,133		4,222,813
	4,222,532		4,222,797		4,223,232		4,222,379		4,223,134		4,222,817
	4,222,663		4,222,801		4,223,278		4,222,407		4,223,153		4,222,870
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01 :	4,222,795		4,222,832		4,223,397		4,222,463		4,223,171		4,222,976
	4,222,930		4,222,841		4,223,401		4,222,468		4,223,228		4,223,058
	4,223,124		4,222,907	10 :	4,222,223		4,222,474		4,223,339		4,223,096
04 :	4,222,270		4,222,991		4,222,789		4,222,538		4,223,340		4,223,233
	4,222,366		4,223,013		4,222,922		4,222,561		4,223,366		4,223,246
	4,222,451		4,223,026		4,222,924		4,222,578	19 :	4,222,442		4,223,250
	4,222,629		4,223,043		4,223,207		4,222,582		4,222,875		4,223,252
	4,222,672		4,223,048	12 :	4,222,162		4,222,616	20 :	4,222,482		4,223,266
	4,222,711		4,223,061		4,222,199		4,222,621		4,222,984		4,223,315
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	4,222,166		4,223,180		4,222,276		4,222,717		4,223,222		4,222,202
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